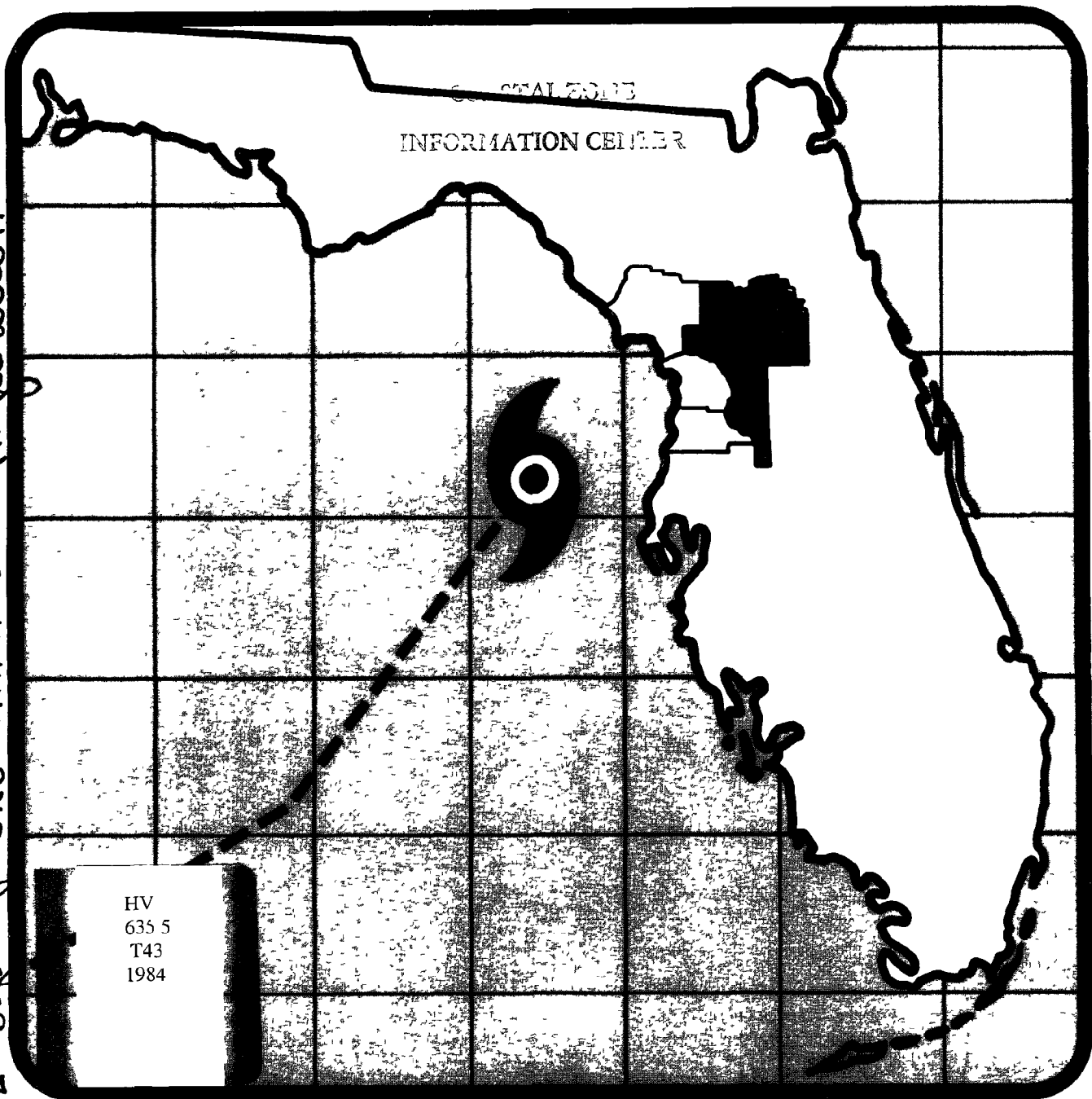


TECHNICAL DATA REPORT

WITHLACOOCHEE INLAND HURRICANE SHELTER STUDY PHASE II

FL Dept of Environmental Regulation



Prepared by the WITHLACOOCHEE REGIONAL PLANNING COUNCIL
July, 1984

TECHNICAL DATA REPORT

WITHLACOOCHEE INLAND HURRICANE SHELTER STUDY

PHASE II

COASTAL ZONE

INFORMATION CENTER

Prepared by the

Withlacoochee Regional Planning Council
1241 S.W. 10th Street
Ocala, FL 32674-2798

July, 1984

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REGIONAL DISASTER PREPAREDNESS
ADVISORY COMMITTEE

The Regional Disaster Preparedness Advisory Committee is composed of government officials and citizens who are involved in various aspects of disaster preparedness. This study would not have been possible without the continuous guidance and review function provided by the Committee. The Withlacoochee Regional Planning Council extends its gratitude to the members of the Committee for their time, effort, and invaluable assistance provided during the preparation of this study.

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CHAPTER I

INTRODUCTION

Purpose

The Inland Shelter Program is the second phase of a statewide hurricane protection plan. The first phase of this plan, the hurricane evacuation strategy, provides an indication of the probable effects of various categories of hurricanes on coastal areas, an estimate of the number of persons needing to be evacuated during each type of hurricane, and recommended evacuation routes for coastal residents. Using this information, the Inland Shelter Program identifies shelter needs, available facilities, and inland evacuation routes. It also provides a mechanism for making shelter assignments and implementing inter-regional evacuation procedures.

The basic premise of the Inland Shelter Program is that, during a hurricane, residents will evacuate coastal areas and seek shelter in more secure inland areas. Because there are insufficient numbers of shelter facilities in the upland areas of coastal counties as well as within inland areas adjacent to coastal counties, it is assumed that many of these people will come to West Central Florida in search of shelter. Besides coastal evacuees, some hurricanes may also necessitate evacuation of threatened residents of inland counties primarily persons living in mobile homes and those living in areas subject to freshwater flooding. The primary purpose of the Inland Shelter Program, then, is to ensure that adequate shelters will be available for both coastal evacuees and inland residents needing shelter during a hurricane.

Scope of Study

The first year of the study involved collecting of data on expected demand for shelters, evacuation routes, and current capacity of public shelters. The second year of the project involved the expansion of usable shelter capacity in the region and the improvement of public information/awareness of hurricane hazards. The extent of the Inland Shelter Study is limited to Marion and Sumter Counties. A separate hurricane evacuation plan was written for the coastal counties of Levy, Citrus and Hernando.

Specific tasks accomplished in completing the Inland Shelter Study are:

1. Determination of shelter usage relative to storm event by storm magnitude.
2. Inventory of designated inland county public shelter characteristics and shelter capacity analysis.
3. Shelter feasibility analysis.
4. The analysis of probable tendencies of potential inland evacuees.
5. The identification of additional shelter space needed to house coastal evacuees from the Tampa Bay Planning Region.
6. The development of intra- and inter-regional evacuation routes and shelter assignments.
7. The identification of sites for shelter checkpoints.
8. The development of a proposed institutional framework to formulate a coordinative mechanism for implementing inter-regional evacuation procedures.
9. The continuous participation, involvement, and coordination by the participating agencies and entities that are relevant to the plan.

Description of Study Area

The Withlacoochee Region is made up of five counties: Citrus, Hernando, Levy, Marion and Sumter. It includes 22 municipalities and encompasses 4,532 square miles. The region is located in the west-central area of Florida, with Citrus, Hernando, and Levy Counties bordering the Gulf of Mexico. At the present time the region retains its primarily agricultural character. Only Ocala is large enough to be designated as a Standard Metropolitan Statistical Area (SMSA) by the U. S. Bureau of the Census.

While the region contains only one SMSA, it is surrounded by SMSA's to the north, the east, the southeast, and the south. The region has not yet experienced urban encroachment from the surrounding SMSA's, although there has been a large influx of persons from the more urban areas who find the still rural character of the region inviting.

The study area of this report covers Marion and Sumter Counties. Marion County is located near the geographic center of Florida. It is bounded by Alachua County and Putnam County on the north; Lake County on the east; Citrus; Sumter and Lake Counties on the south; and Levy County on the west. The land surface is slightly irregular with gently sloping hills. Elevations range from a low of 50 feet to a high of 200 feet above sea level. Growth has been experienced throughout the county, especially in Ocala.

Sumter County is characterized by nearly level plains and swamps, gently sloping in a westerly direction toward the Withlacoochee River. Ground elevations range between 40 to 140 feet above sea level. Sumter is a rural and agriculturally oriented county. Its western borders with Citrus and Hernando Counties are the Withlacoochee and Little Withlacoochee Rivers. Polk County borders it on the south and southwest. Marion County makes up its northern border, while Lake and Polk Counties account for its eastern border.

Growth in Sumter County has been moderate, with the greatest growth occurring between 1970 to 1979, when the population increased from 14,839 to 22,041 or 7,202 people. It is expected there will be little encroachment on land used as agriculture, and Sumter County will retain its rural status. As expected, growth is taking place around the Lake Panasoffkee area in the form of a major retirement development. The Wildwood area in the northeastern portion of the county is not only experiencing growth in the form of residential development but in industrial development as well.

The inland counties, while not subject to storm surge hazards, are susceptible to high winds and freshwater flooding. Both counties are susceptible to high wind hazards because a great many residents occupy mobile homes.

As of January, 1981, Marion County had 12,599 mobile home units and Sumter County had 3,375 units.

Two major evacuation routes through the inland counties are U.S. Rt. 301 and I-75. Both routes are expected to carry significant portion of the north bound evacuees in the event of a major hurricane in the Tampa Bay Region.

Evacuation Organization/Legal Authority

Authority to order evacuation from an approaching hurricane is conferred to the governor by Florida Statute Chapter 252.36(5)(e); stating that the governor may:

"Direct and compel the evacuation of all or part of the population from any stricken or threatened area within the state if he deems this action necessary for the preservation of life or other disaster mitigation, response, or recovery."

The same power is also delegated to the governing body of each city and county of the state by Florida Statute 252.32, and Executive Order 80-29. This power to order an evacuation exists without prior declaration by other levels of government. For example, in the event that a county or state fails to order evacuation as early as a city may feel is required by specific location conditions, the municipality may order evacuation within its corporate limits. However, declarations and evacuation orders of higher levels of government are binding upon lower levels of government. For example, a state declaration is binding upon counties and municipalities, and a county order is binding upon a municipality.

A need exists for coordination between equal and separate levels of government and private agencies to ensure the availability of adequate resources to support evacuation. This will enable the release of the resources of higher levels of government which would not be available without an emergency declaration by that higher level of government.

Agencies that would need to be involved in the coordination effort include the several city and county (but primarily county) disaster preparedness agencies.

An addition to local agencies is the Bureau of Emergency Management, under the Division of Public Safety Planning and Assistance, Department of Community Affairs. This Bureau is empowered to make official recommendations for prevention and preparedness measures designed to eliminate or reduce disasters or their impact. As a consequence, the Bureau of Emergency Management performs the primary staff function to the governor during disaster emergencies and recommends to the governor the nature, extent, and timing of an evacuation order.

First among private agencies in coordination is the American National Red Cross. The local chapters of the Red Cross are responsible for the overall management of public natural disaster shelters as designated by local government. This includes the provisions of trained staff, food supplies, and registration procedures throughout the duration of the shelter stay. Such responsibility has been delegated by Congressional charter under Public Law 58-4. A mutual agreement between the American Red Cross and the Florida Department of Health and Rehabilitative Services (HRS) states that HRS will lend selected staff to the Red Cross when a need for supplemental personnel arises. A number of other independent public and private agencies possess a role, including school

districts, Salvation Army, churches, police and fire agencies, utility companies, and so forth.

The vast array of authorities who may issue an evacuation order and who may participate in an evacuation clearly illustrates the need for a firmly established on-going inter-governmental coordination process. The results of this study will contribute to the data base necessary to ensure effective coordination as well as provide a tool the local decision-maker can use to analyze his jurisdiction's shelter supply in relation to surrounding jurisdictions.

CHAPTER II

METHODOLOGY, BACKGROUND AND RESEARCH

This chapter will discuss the data collected on shelter demand, evacuation routes and shelter capacity in the Withlacoochee Region. The objective of this analysis and data collection is to provide a reliable analytical framework for formulation of the evacuation plan which is discussed in Chapter III.

For ease of reading and cross reference, the maps and tables discussed in the narrative are grouped in sequence following the narrative.

Hurricane Hazard Analysis Element

The major hazards associated with a hurricane are: (1) storm surge and saltwater flooding; (2) high winds; and (3) fresh water flooding. In the inland counties the hazards relevant to potential inland area evacuation are limited to freshwater flooding and high winds.

The Impacts of Freshwater Flooding

Freshwater flooding occurs as a result of rainfall before, during and after a hurricane. About 6 to 12 inches of rainfall can be expected to accompany a hurricane, although no predictive tools are available for determining the rate and geographic distribution of the rainfall. In Marion and Sumter Counties the problems associated with freshwater flooding during a hurricane include: lake and river flooding necessitating evacuation of homes; and inundation of possible evacuation routes. Freshwater flooding in the inland counties is usually slowly rising water that does not create a life threatening situation.

The Impact of Hurricane Winds

Hurricane force winds are defined as attaining and exceeding sustained wind velocities of 74 mph; sustained winds being defined as the average wind value for 1 minute interval. There have been reported cases of hurricane winds reaching as high as 190 mph. In addition to sustained winds, peak gusts are also a factor to consider. The peak gust is the highest, instantaneous wind-speed value observed; the damage potential induced by gusts may be greater than even that of hurricane-generated tornadoes.

Although the impact of sustained winds on large building structures has been examined using wind-tunnel tests and numerical modeling procedures, no experiments in the real atmosphere have been conducted to determine the impact of hurricane gusts on structures. However, it is clear that sustained hurricane force winds and peak gusts can cause roof failure, the outward collapse of walls and glass openings, and enormous agricultural losses.

It should be recognized that structural losses due to wind alone, in the absence of an earlier rupture or weakening from a structure by rising water, can be virtually eliminated in new construction. This can be accomplished through using appropriate building standards such as the Southern Standard Building Code although some increase in building costs can be expected.

In the Withlacoochee Region, mobile homes are the structures most vulnerable to hurricane force winds. They are necessarily of lightweight construction, with generally flat sides and ends. Because of these characteristics, the winds of hurricanes can toss mobile homes around, rolling them over and over to complete the destruction. In addition, mobile homes are also more susceptible to damage from flying debris.

Although local regulations require that mobile homes be anchored to withstand high winds with "over-the-top" and frame tiedowns, anchorage system requirements usually are designed only to withstand a wind velocity of from 70 mph to 100 mph. In addition, the threat of flying debris is not mitigated by tiedowns. Because hurricane winds can reach 190 mph, the National Weather Service recommends that mobile home residents move to more sound structures prior to the onset of hurricane winds.

Not only must the high winds hazard be considered for its ability to damage property, but also for its ability to interrupt evacuation efforts. Evacuation activities cannot be safely carried out after the arrival of sustained gale force winds (40 mph), generally several hours before hurricane eye landfall. Therefore, it is recommended that all evacuees should have completed their movement to safe destinations before the arrival of these winds.

Hazard Analysis Concept

While it is assumed that 6 to 12 inches of rainfall accompany a hurricane, no predictive tool is available for determining the rate and ultimate geographic distribution of freshwater flooding. Freshwater flooding does not normally necessitate the emergency evacuation of large numbers of residents as does storm surge. However, it does require that evacuation take place prior to freshwater inundation of roadways.

The at-risk population due to wind hazards was calculated by multiplying the number of mobile homes in each county by the average household size for that county. The average household size for Marion and Sumter counties is 2.6 and 2.7 persons per household respectively. (This information was obtained from the Florida Statistical Abstract, 1980.)

In order to provide a more accurate indication of the number of persons vulnerable to hurricane force winds, that is, mobile home residents, in the Withlacoochee Region, additional data were obtained from the Florida State Data Center, regarding the number of mobile home residents. Table 11, Persons in Occupied Housing Units by Tenure by Units in Structure, from Summary Tape File 3-A of the U.S. Census provides this information. In addition, the average number of residents per mobile home for each county, according to the U.S. Census, was applied to the number of mobile home units constructed subsequent to the U.S. Census and up to December 1982 were added to the Census figures. A breakdown of persons at-risk by evacuation zone is provided in Table 2-1.

Hazard Analysis Results

The hazards of the hurricane will require the evacuation of 32,759 persons in Marion County and 9,113 persons in Sumter. The total population at-risk in the inland counties is 41,872. This information is presented in Table 2-2.

Inland Shelter Demand Element

West Coast Storm

Assuming worst probable conditions, a storm striking the inland Withlacoochee Region from the west will require evacuation of all mobile home residents and those at-risk due to freshwater flooding. The hazard analysis has identified the total evacuating population for each county and the pre-planned destinations of this population has been determined by the behavioral survey. The inland shelter demand is presented in Table 2-3.

The intensity of the storm, assuming hurricane force winds are present, is not expected to increase the number of inland evacuees significantly. The number of evacuees is not directly correlated with the intensity of the storm because the least intense storm will trigger evacuation of all mobile home and flood prone area residents.

As a storm moves over land, the wind speed generally decreases. However, the rate of decline in wind speed is uncertain. Therefore, it is assumed that inland mobile home residents should evacuate if an evacuation order is issued. For planning purposes it is assumed that the storm maintains its strength over land thereby requiring the evacuation of those at-risk. Since it is impossible to predict how much flooding will accompany a hurricane, flood prone area residents are assumed to be at-risk.

East Coast Storm

A storm approaching from the east is assumed to be of hurricane intensity thus requiring the evacuation of all at-risk inland residents. Accordingly, the evacuating population will be identical to that of a west coast storm. Therefore, the inland shelter demand for an east coast storm is as presented in Table 2-3.

Coastal Shelter Demand Element

West Coast Storm

Withlacoochee Coastal Evacuees. A hurricane striking the west coast of Florida in or near the Withlacoochee Region will cause a significant number of persons to evacuate. The evacuating population under worst probable conditions (surge level "B") is shown below.

<u>County</u>	<u>Evacuation Population</u>
Levy County	13,919
Citrus County	29,261
Hernando County	25,597
TOTAL WITHLACOOCHEE EVACUEES	<u>68,777</u>

Of this evacuating population, it is estimated that 21,046 persons will go to a public shelter, with the remaining evacuees going to a motel or to a friend or relative in a safe structure. As can be seen in Table 2-4 the available public shelter space in each county exceeds the number of persons requiring shelter as determined by the vulnerability analysis. Accordingly, evacuation in the coastal counties will have little impact on the demand for public shelters in the inland area.

Tampa Bay Region Evacuees. In the case of a west coast storm the demand for shelter in the inland counties will be great. The number of evacuees desiring shelter in the Withlacoochee Region has been estimated by the Bureau of Emergency Management. This was accomplished through an analysis of the Tampa Bay evacuation data which was expressed in terms of regional evacuation scenarios. Regional Scenario #2 generates the most shelter-bound evacuees for this region. Approximately 53,593 are expected to enter the Withlacoochee Region. The assumptions and calculations used to estimate the shelter bound evacuees is presented in Appendix B. According to the coastal analysis, 16,793 of those evacuees will seek shelter in coastal counties. Thus, the remaining 36,800 evacuees will seek shelter in the inland counties of Marion and Sumter.

East Coast Storm

East Central Florida Coastal Evacuees. The demand for public hurricane shelter as a result of an evacuation of the east coast of Florida depends upon the shelter capacity of the East Central Florida planning region. According to East Central Florida Regional Planning Council, sufficient shelter capacity exists in the East Central region to accommodate those seeking public shelter.^{1/} This conclusion is predicated on the following assumptions that are a part of the calculations by the East Central Florida Regional Planning Council.

1. that segment of the evacuation population choosing to leave the region would seek shelter in a hotel/motel or home of a friend, not a public shelter;
2. those routed to the East Central Florida region would seek shelter within the region and not pass on through to other counties further north;
3. should the demand for hotels/motels in East Central Florida exceed their capacity, the surplus would be assigned to public shelters within the region;
4. it is unlikely that any significant segment of the out-of-region evacuation population intending to go to the home of a friend would end up at a hotel/motel or public shelter; and
5. an undeterminable number of coastal evacuees may require public shelter due to unforeseeable individual circumstances.

^{1/}East Central Florida Regional Planning Council, "Methodology for Determining the Inland Shelter Requirements for East Coast Hurricane Scenarios", March, 1983.

While it is difficult to predict the demand for shelter services in the Withlacoochee Region resulting from an east coast storm, it is apparent that the East Central Region has sufficient hotels/motels and public shelter capacity to accommodate the east coast evacuees under worst probable conditions. Past experience has shown however, that a significant number of evacuees will seek shelter in the Withlacoochee Region in spite of the availability of shelter in the East Central region. In hurricane David, an estimated 1,000 persons entered the Region seeking public shelter. For purposes of this study, it is assumed that about 1,000 East Central residents will seek public shelter in the region.

Withlacoochee Coastal Evacuees. Should a storm strike the east coast and exit through the Withlacoochee Region, a significant number of persons will evacuate from the surge vulnerable areas and from mobile homes. While the coastal shelter demand from such a storm will be significant, all those evacuating can be sheltered with the coastal counties of Levy, Citrus and Hernando. Thus no demand for inland shelters from Levy, Citrus and Hernando Counties is anticipated from an east coast storm which exits through this region.

Total Shelter Demand Element

West Coast Storm

The total shelter demand for a west coast storm consists of (1) inland residents; (2) Withlacoochee coastal evacuees; and (3) Tampa Bay Region evacuees. A portion of each of these components will require public shelter.

1. Inland Residents

The inland residents at-risk are those subject to freshwater flooding and those vulnerable to high winds. Of the 41,872 persons at-risk in Marion and Sumter Counties, approximately 22,527 will require public shelters.

2. Withlacoochee Coastal Evacuees

The evacuating population from the coastal areas of Levy, Citrus and Hernando Counties is not expected to create a demand for public shelter in Marion and Sumter counties. As previously stated, sufficient public shelter in the coastal counties is available for those residents desiring shelter.

3. Tampa Bay Region Evacuees

The influx of Tampa area residents desiring shelter in the Withlacoochee Region is considerable. Assuming a worst probable hurricane event in terms of incoming evacuees (Regional Scenario #2) an estimated 36,800 persons are expected to require shelter in the inland counties. As is discussed in the Shelter Inventory section, the inland counties have insufficient shelter to accommodate all those requiring shelter in this situation. Those that cannot be accommodated in this region will have to pass through to other areas.

East Coast Storm

The total shelter demand anticipated as the result of a storm on the east coast of Florida consists of (1) inland Withlacoochee residents; (2) East Central Florida evacuees; and (3) Withlacoochee coastal evacuees.

As is the case with either the west or east coast storms, it is assumed that at-risk inland residents are ordered to evacuate. That generates about 22,527 persons requiring shelter within the inland counties of the Withlacoochee Region.

Residents of the East Central Florida Region requiring shelter in the inland counties is estimated to be 1,000 persons based upon the experience with hurricane David.

Coastal areas of the Withlacoochee Region may need to be evacuated in an east coast storm. In any event, these evacuees should find sufficient shelter space in the coastal counties.

Comparison

The total public shelter demand in the inland counties anticipated as a result of an east coast compared to a west coast storm is shown below.

	<u>East Coast Storm</u>	<u>West Coast Storm</u>
Inland Withlacoochee	22,527	22,527
Withlacoochee Coastal	0	0
Tampa Bay	0	36,800
East Central Florida	<u>1,000</u>	<u>0</u>
TOTAL	23,527	59,327

Clearly, the West Coast case generates a much greater burden on public shelter facilities than the East Coast case. Under worst probable conditions of a west coast storm insufficient shelter spaces will be available for evacuees, thus requiring a large number of persons to pass through the region to other areas.

Shelter Inventory Element

Public Shelter Inventory

An inventory of the shelters in the inland counties of the Withlacoochee Region was conducted in February and March of 1981. These shelters will provide protection from the elements for the duration of a hurricane event. To be truly effective, public shelters need independent water, sewer and emergency power systems. They also need to be accessible in times of heavy rainfall.

The suitability of a structure as a public hurricane shelter depends upon several specific factors. These include location, accessibility, parking facilities, building characteristics and amenities, kitchen facilities and so on. All primary shelters, designated by the county civil defense director, are those structures that are structurally sound and that do not have major flooding problems.

To estimate the planned capacity of the inland shelters it is assumed the evacuees will require either 20 sq. ft. per person for a 24 hour stay, or 40 sq. ft. per person for a 48 hour stay. The capacity of a shelter is directly related to suitable square footage present in the structure. Areas suitable for the sheltering of evacuees must have few or small windows to prevent injury from flying glass.

The criteria used to analyze shelter space are as follow:

usable	- An area consisting of no windows or a small percentage of windows.
questionable	- An area consisting of one wall covered with a moderate to high percentage of windows.
unusable, not counted as space	- An area consisting of two walls covered with a moderate to high percentage of windows.
unusable, not counted as space	- Portable buildings, restrooms, storage areas, kitchen, offices, heavy equipment areas, maintenance rooms, clinics, etc.

Sumter County

Sumter County public shelters are school buildings with a total capacity of 6,407 people at 20 sq. ft. per person. These shelters are listed in Table 2-5. Sumter County public shelters are shown on Maps 2-1, 2-2, and 2-3.

Marion County

The Marion County public shelter inventory reveals that about 29,329 persons could be accommodated for a stay under 24 hours (using the 20 sq. ft. per person criteria). Marion County primary shelters are shown in Table 2-6, and on Maps 2-4 and 2-5.

Shelter Feasibility Analysis Element

Marion County Shelter Feasibility Analysis

In Marion County, most buildings designated as primary shelters do not have auxiliary power or an available emergency water supply. Water and wastewater treatment are primarily provided by municipal service, although some use wells, septic tanks, and on-site wastewater treatment plants. While most of the kitchen facilities require electric power for cooking, a significant percentage have gas or a combination of gas and electric. Ample parking may be a problem at some shelters due to a small number of parking spaces or a limited area for potential parking. This information is displayed in Tables 2-7 and 2-8.

Most shelters do not have an infirmary as such, but do have some cots and essential first-aid supplies. The adequacy of first-aid facilities is dependent upon the amount of people with injuries and the severity of the injury. The amount of food available will vary according to the amount of people seeking shelter. Most of the people interviewed for the shelter survey indicated that they should provide food service for a few days at most.

In addition, several shelters have facilities to accommodate the elderly and handicapped, a means of transportation on site, and access to a ham radio. These are listed in the comments section of Table 2-8.

Sumter County Shelter Feasibility Analysis

Of all the shelters surveyed in Sumter County only two were equipped with an auxiliary source of electrical power: South Sumter High School, and Wildwood High School.

Most shelters have kitchen facilities that operate on electrical power, making cooking impossible in the event of a power failure. Another concern in the event of a power failure is the interruption of water supply and the operation of sewage systems. The need for dependable water and sewer systems is crucial to the safe operation of a public shelter.

As is the case in Marion County, most shelters in Sumter County have minimal emergency medical facilities. Most have a small infirmary room with one or two cots and a small first aid kit.

The Sumter County primary shelter characteristics are summarized in Tables 2-9 and 2-10.

With a few exceptions, the shelters designated in this public shelter survey are without a source of auxiliary power. In the event that a hurricane moves inland causing widespread power disruption, most of the shelters would be without electricity or potable water. For purposes of disaster planning, the worst probable case must be assumed in which widespread power failure occurs due to the breakdown of overhead power lines.

The facilities that could continue to operate in the event of a power failure are listed in Table 2-11. This amounts to shelter space for about 9,057 persons.

Many more shelters will be acceptable if an auxiliary supply of electricity is made available for each shelter.^{1/} An emergency supply of potable water is also necessary to insure that the restrooms remain operational. Without auxiliary electricity and water only about 9,000 persons can be accommodated in the shelters. On the other hand, should the shelters be equipped with emergency electricity and water, a much greater number of persons may be sheltered.

Alternate Shelter Inventory Element

This element will describe the need for additional shelter facilities in the region. Alternate shelter facilities will be reviewed for consideration as officially designated public shelters and the pre-requisites for official shelter designation will be discussed.

^{1/} However, it should be noted that Sumter County shelters without auxiliary power will be used.

Estimate of Additional Shelters Needed

A review of the sheltering capacity available at designated primary shelter facilities reveals that a shortfall exists between the number of spaces available and the number of spaces needed. This shortfall is most dramatic under the storm evacuation scenarios for the Tampa Bay Region. It appears that the worst case in terms of shelter need for the Withlacoochee Region occurs as the result of a hurricane in the Tampa Bay Planning Region. This being the case, it is necessary to expand the inventory of usable shelters to accommodate shelter bound evacuees from the Tampa Bay region.

Table 2-12 compares the primary shelter capacity of the inland counties with the estimated number of persons requiring shelter from the Tampa Region. As indicated in the Shelter Inventory Element, the current designated shelter space in Marion County amounts to 29,329 with 6,407 available spaces in Sumter County. The combined primary shelter capacity for the inland counties is 35,736 spaces. Table 2-13 shows the shortfalls in shelter capacity for each regional scenario. Scenario 2 shows the most dramatic shortfall of 23,591 spaces for evacuees. This comparison provides a goal or target for provision of additional shelters. It should be noted however, that a portion of the shelter bound evacuees entering the Withlacoochee region will pass through and seek shelter beyond the region.

Alternate Shelter Inventory

The first-year report of the Inland Shelter Study revealed a net shelter deficit in the number of public shelter spaces required to accommodate evacuees from within the region and from Tampa Bay. To expand the inventory of available public shelters, a survey of churches and civic buildings was conducted.

The procedure used to inventory shelters consisted of two steps. First, Crisis Relocation Plan Host Area Facility Siting Surveys (CRP) were used to obtain the shelter capacity of the churches and civic buildings located in the inland counties of the Withlacoochee Region. Those buildings which had a capacity of 200 persons or greater, at 20 square feet per person, were selected to be inventoried for feasibility and capacity. The reasons for this selection process were threefold. First, shelters with a larger capacity are more able to accommodate evacuees. Second, too many shelters would present logistical problems in the evacuation process and cause confusion. Third, a much greater number of management personnel relative to the number of evacuees served would be required.

A telephone survey was then conducted on the selected shelters using the inventory form in Figure 2-1. Survey respondents were asked questions regarding structural integrity and usable shelter capacity. If the respondents were not certain as to the shelter capacity, the CRP listing was given as a reference. It should be noted that only churches and civic buildings are the only additional shelter inventoried in this report. Upon recommendation from the Regional Disaster Preparedness Advisory Committee, it was decided that the use of private businesses, such as shopping centers and office buildings, would not be practical.

The results of this survey are presented in Tables 2-14 and 2-15.

Sumter County

The alternate shelter sites for Sumter County consist of ten facilities, all churches. These shelters will provide space for 2,673 persons. (Table 2-14)

Motels and hotels are a preferred destination for many evacuees and tend to fill up quickly when a hurricane watch is announced. Table 2-16 summarizes the motel room units in Sumter County. The 538 motel units in Sumter County amounts to space for about 2,098 people.* By applying the motel vacancy rate for the region during hurricane season we can estimate the available capacity in the motels during this time period. This calculation indicates that vacancies sufficient to accommodate 780 persons exists in Sumter County during the hurricane season. This is an average figure based upon the overall vacancy rate for hurricane season. The motel vacancy rates are subject to constant change.

*Assuming that 95% of the motel rooms have space for four people and the remaining 5% have room for two people.

Marion County

Alternate shelter sites in Marion County include churches, meeting halls and other public oriented buildings. These structures are listed in Table 2-15.

Table 2-17 lists the hotels and motels in Marion County, having a total of 2,927 units. This is equivalent to space for about 11,412 people. By applying the motel vacancy rate for Marion County during hurricane season to the total number of units we can estimate the number of vacant units. This calculation indicates that space for about 4,462 people is available for evacuees in Marion County hotels/motels during hurricane season.

Behavioral Analysis Element

Scope of Study

An essential type of data that must be examined when attempting to quantify public shelter requirements is the human factor of hurricane response. The tendencies and choices of potential evacuees in the following types of response must be quantified:

- . when the threatened population would leave their residences in relation to a given evacuation order
- . the number of vehicles that the threatened household would utilize for evacuation
- . the number of threatened households that would require transportation or other assistance if ordered to evacuate
- . the pre-planned destinations of the potentially threatened population
- . the general hurricane experience of the potentially threatened population

The quantification of the above types of response is also valuable in planning evacuation times, planning emergency mass transportation of those evacuees without private means of transportation, and planning an effective public information/hazard awareness program.

In order to quantify such potential types of hurricane response by vulnerable residents of the Withlacoochee Region, WRPC employed the firm of H. W. Lochner, Inc. to conduct a statistically significant survey of their tendencies. The

survey took the form of about 1,000 telephone interviews of residents at-risk from hurricane hazards. In the three coastal counties about 500 residents living within the worst probable storm surge zone were surveyed. In Marion and Sumter Counties 500 residents subject to wind hazards were surveyed. Since the inland counties are not subject to the hurricane surge, the sampling frame for inland residents was limited to the residents of mobile homes. A description of the methodology used to survey the residents' tendencies is provided in Appendix D.

Major Findings

The findings of the survey pertaining to the inland counties are summarized in Table 2-18. For purposes of determining shelter requirements, the results of the questions on destination are significant. The survey indicated that about 40.0 percent of the respondents will require shelter, with about 25.7 percent not knowing their destination.

The remaining evacuees would go to a hotel/motel or friend. For planning purposes the "don't know" and "shelter" responses are added together. This procedure would mean that about two-thirds (40.0% plus 25.6%) of the population-at-risk would have to be sheltered. This poses a problem of potentially excessive demand on shelters.

Most civil defense professionals would question whether such a large population would actually use shelters, or whether it would be feasible to provide such space. Also, based upon monitoring of selected interviews and further discussions with the professional interviewers, the strong impression of the consultant is that many inland mobile home residents have never thought about evacuating. In other words, the interviewers caught these respondents by surprise. Given a few hours, many of the "shelter" and "don't know" respondents would probably make non-shelter arrangements.

Conversely, many retired mobile home residents:

1. Do not have an extended family in Florida;
2. Are friends mainly with their immediate neighbors who are facing the identical hazard and, therefore, can not offer any better refuge;
3. Are handicapped.

Some of the more progressive operators of mobile home parks have established evacuation shelter plans within on-site clubhouses and similar facilities. The overall public advantages to such an approach are incalculable. For example:

1. A significant number of vehicles would not be on the public roadways.
2. A significant number of elderly drivers would not be driving in hazardous conditions.
3. Communities of social support would remain intact.

Several respondents, however, indicated that they planned to go to facilities that might appear safe, but are quite dangerous. Although most people understand the hazards of large glass areas, most people do not realize the dangers of the long span roofs of many auditorium-type facilities.

In sum, the potentially excessive demand on shelters can be modified by two basic approaches:

1. Early educational programs strongly urging residents to consider the evacuation possibility and to make private arrangements. In Pinellas County, for example, the Red Cross openly advises people that shelters offer considerably less than desirable living conditions.
2. Encouragement and possible requirements of existing and proposed mobile home parks (especially the larger ones) to have hurricane plans and/or shelters. These activities could be used as valid support to modify the behavioral survey results.

The major conclusions that can be drawn from the behavioral study are listed below.

1. The vast majority of the households (98.2 percent of the inland residents) would respond either immediately or rather promptly to an evacuation order.
2. Significant proportions of the available vehicles (28.3 percent of the inland vehicles) would not be used during the evacuation thereby helping to reduce the traffic problem.
3. While the needs for general (bus or taxi) transportation service and specialized transportation (handicapped) service are a small percentage, these demands could become a logistical problem involving thousands of persons within an already strained situation. The general transportation problem can resolve itself through increased education, citizen cooperation and advanced private arrangements.

4. The indicated shelter space needs for the inland mobile home residents exceed 65 percent of the sample population. This figure is most likely excessive. The typical inland resident of a mobile home simply has not considered evacuating and needs to be educated. Also, measures to provide shelters within large mobile home parks, such as in club-houses, should be vigorously pursued.

The results of the destination survey were reviewed by the Technical Advisory Committee to derive a set of destination percentages for use in the transportation analysis. It was decided that a weighted distribution of the "don't know" answer to the other categories would be most appropriate. The evacuee percentages by destination type for both the inland counties are as follows:

<u>Destination</u>	<u>Behavioral Survey</u>	<u>Adjusted</u>
Red Cross Shelter	40.0%	53.8%
Friend/Relative	13.7%	18.5%
Hotel/Motel	20.6%	27.7%

5. A clear minority of the population has experienced the direct hit of a hurricane and many respondents have a misconception that they have had such an experience.
6. Under the "perception of threat" category in Table 3-1 it can be seen that 22 percent of the respondents think that their mobile home is safe in a hurricane. A clear educational challenge for public officials is indicated in those results.

A sample of the form used to conduct the behavioral survey is shown in Appendix D.

TABLE 2-1

INLAND COUNTY PERSONS AT-RISK BY EVACUATION ZONE

Marion County Zonal Data by Evacuation Zones			
<u>EVAC</u>	<u>TDU</u>	<u>MH DU</u>	<u>FW</u>
M01	1453	426	0
M02	2066	516	0
M03	5348	1164	0
M04	4536	1870	0
M05	971	134	0
M06	1526	162	0
M07	3938	733	0
M08	5878	2138	0
M09	2268	573	0
M10	4070	2191	0
M11	997	305	0
M12	1709	860	0
M13	2450	356	0
M14	15473	1171	0

Sumter County Zonal Data by Evacuation Zones

<u>EVAC</u>	<u>TDU</u>	<u>MH DU</u>	<u>FW</u>
S01	562	109	0
S02	1363	394	0
S03	1082	214	0
S04	1395	661	0
S05	2128	833	0
S06	532	206	0
S07	419	98	0
S08	555	136	0
S09	810	393	0
S10	1247	281	0

EVAC = Evacuation Zone Number
 TDU = # of Total Dwelling Units
 FW = # of Units in Freshwater Flood Prone Areas
 MH DU = # of Mobile Home Dwelling Units

Source: Transportation Analysis - Withlacoochee Regional Hurricane Evacuation Plan, PBSJ, August, 1983, pp. C4 and C5.

TABLE 2-2

Total Inland County Population At-Risk

<u>County</u>	<u># Persons Per Mobile Home Unit</u>	<u># Persons Per All Other Units</u>	<u>Population At-Risk</u>
Marion	2.6	2.6	32,759
Sumter	2.7	2.7	<u>9,113</u>
TOTAL			41,872

TABLE 2-3

Inland Shelter Demand

	<u>Residents At-Risk</u>	<u>Residents Requiring Public Shelter^{1/}</u>
Marion	32,759	17,625
Sumter	<u>9,113</u>	<u>4,902</u>
TOTAL	41,872	22,527

^{1/}This represents 53.8% of the residents at risk for both Marion and Sumter Counties. Based upon the behavioral survey and the transportation analysis, the population at risk was distributed to three destinations: Red Cross shelter (53.8%), Friends Home (18.5%), and Hotel/Motel (27.7%).

SOURCE: Post, Buckley, Schuh & Jernigan, 1983, p. F7-8.

TABLE 2-4
COASTAL DEMAND FOR PUBLIC SHELTER - WITH LACOOCHEE
REGION ONLY

	<u>Evacuating Population^{1/}</u>	<u>Persons Requiring Public Shelter^{2/}</u>	<u>Total Shelter Capacity</u>	<u>Surplus Capacity</u>
Levy	13,919	4,259	6,148	1,889
Citrus	29,261	8,954	21,013	12,059
Hernando	<u>25,597</u>	<u>7,833</u>	<u>11,018</u>	<u>3,183</u>
TOTAL	68,777	21,046	38,179	17,131

^{1/} Assuming vulnerability level 'B' in which all surge vulnerable zones are evacuated.

^{2/} This represents 30.6% of the persons at risk for the coastal counties. Based upon the behavioral survey and the transportation analysis, the population-at-risk was distributed to three destinations; Red Cross Shelter (30.6%), friends home (40.6%), and hotel/motel (78.8%).

SOURCE: Post, Buckley, Schuh & Jernigan, 1983, p. F1-6.

TABLE 2-5

SUMTER COUNTY PRIMARY SHELTERS

<u>Primary Shelter</u>	<u>Address</u>	<u>Capacity 20 sq.ft./person</u>
Bushnell Elementary School	Flannery Ave., Bushnell FL 33531	74
North Sumter Intermediate School	Huey St., Wildwood, FL 32785	462
North Sumter Primary School	Warfield Ave., Wildwood, FL 32785	140
South Sumter High School	Highway 475 North, Bushnell, FL 33513	1692
South Sumter Middle School	N. W. 10th Street, Webster, FL 33597	948
Webster Elementary School	Highway 471, Webster, FL 33597	514
Wildwood High School	Huey St., Wildwood, FL 32795	1532
Wildwood Middle School	Fruitland Park Road, Wildwood, FL 32785	1045
TOTAL		6407

Source: Withlacoochee Regional Planning Council staff, Sumter
County Shelter Inventory, March, 1982.

TABLE 2-6

MARION COUNTY PRIMARY SHELTERS

<u>Name of Structure</u>	<u>Address</u>	<u>Shelter Capacity at 20 Sq. Ft./Person</u>
Belleview Elementary	5556 S.E. Agnew Road Belleview	166
Belleview-Santos Upper Elementary	N. Hwy. 444 Belleview	810
College Park Elementary	3155 S.W. 26th Street Ocala	560
Dunnellon Elementary	Chestnut Street Dunnellon	480
Dunnellon High School	Chestnut Street Dunnellon	1,452
East Marion Elementary	County Road 326 Lynne	1168
Eighth Street Primary	513 S.E. 8th Street Ocala	536
Fessenden Elementary	State Road 25A Martin	836
Forest High School	1614 S.E. Ft. King St. Ocala	1672
Fort King Middle	545 N.E. 17th Street Ocala	1010
Ft. McCoy Elementary	State Road 315 Fort McCoy	265
Hillcrest	3143 S.E. 17th Street Ocala	66
Howard Upper Elementary	306 N.W. 7th Avenue Ocala	213
Lake Weir Middle	Sunset Harbor	1600
Lake Weir High	State Road 464	3346

TABLE 2-6

MARION COUNTY PRIMARY SHELTERS (cont'd)

<u>Name of Structure</u>	<u>Address</u>	<u>Shelter Capacity at 20 Sq. Ft./Person</u>
Madison Street Primary	1239 N.W. 4th Street Ocala	812
Marion Education Resource Center	2091 N.E. 35th Street Ocala	180
North Marion High	State Road 329 Sparr	2696
North Marion Middle	Lower Sparr Road Sparr	3896
Oakcrest Elementary	1156 N.E. 28th Street Ocala	245
Reddick-Collier Elementary	State Road 25A Reddick	774
Sparr Elementary	State Road 329 Sparr	282
Stanton-Weirsdale Elem.	W. Hwy. 42 Weirsdale	512
Vanguard High	7 N.W. 28th Street Ocala	4854
Wyomina Elementary	511 N.E. 12th Avenue Ocala	898
TOTAL		29,329

Source: Withlacoochee Regional Planning Council staff, Marion
County Shelter Inventory, March, 1982.

TABLE 2-7

MARION COUNTY PRIMARY SHELTER CHARACTERISTICS

Shelter Name	Independent Power	Independent Water	Sewage Septic/Sewer	Kitchen Gas/Electric
Belleview Elementary	No	No	Sewer	Electric
Belleview-Santos Upper Elementary	No	No	Septic	Gas & Electric
College Park Primary	No	No	Sewer	Gas
Dunnellon Elementary	No	No	Sewer	Electric
Dunnellon High	No	No	Sewer	-
East Marion Elementary	No	No	Sewer	Electric
Eighth Street Elementary	No	No	Sewer	Gas
Fessenden Elementary	No	No	Sewer	Electric
Forest High	Yes, Science Building	No	Sewer	Gas & Electric
Fort King Middle	No	No	Sewer	Electric
Fort McCoy Elementary	Yes, Whole School	No	Septic	Gas & Electric
Hillcrest School	No	No	Sewer	Electric
Howard Middle	No	No	Sewer	Gas & Electric
Howard Upper Elementary	No	No	Sewer	Electric
Lake Weir High	Yes, Lights	No	Sewer	Gas & Electric

TABLE 2-7

MARION COUNTY PRIMARY SHELTER CHARACTERISTICS (cont'd)

<u>Shelter Name</u>	<u>Independent Power</u>	<u>Independent Water</u>	<u>Sewage Septic/Sewer</u>	<u>Kitchen Gas/Electric</u>
Lake Weir Middle	No	No	Sewer	Electric
Madison Street Primary	No	No	Sewer	Electric
Marion Educational Resource Center	No	No	Septic	Electric
North Marion High	No	No	Sewer	Electric
North Marion Middle	Yes, Whole School Battery, 24 hours	2 large reserve tanks approx. 20,000 gal.	Septic	Gas & Electric
Oakcrest Elementary	No	No	Sewer	Electric
Reddick-Collier Elementary	No	No	Septic	Gas
Sparr Elementary	Yes, Hallway Battery Lights	No	Sewer, cafeteria	Gas & Electric
Stanton Weirsdale Elem.	No	No	Sewer, pkg. plant	Gas & Electric
Vanguard High	No	No	Sewer	-
Wyomina Park Elementary	No	No	Sewer	-

Source: Withlacoochee Regional Planning Council staff, Shelter Inventory, March, 1982.

TABLE 2-8

MARION COUNTY SHELTERS:
VEHICLE CAPACITY AND GENERAL COMMENTS

Shelter Name	Vehicle Capacity		General Comments
	# Parking Spaces	Potential Acres	
Belleview Elementary	-	8-9	Access to ham radio
Belleview-Santos Upper Elementary	65	5	Facilities to accommodate elderly and handicapped
College Park Primary	70	-	
Dunnellon Elementary	21	-	
Dunnellon High	-	-	
East Marion Elementary	0	-	
Eighth Street Elementary	46	-	Parking area at Osceola Middle School
Fessenden Elementary	50	-	
Forest High	450	-	
Fort King Middle	40	8	
Fort McCoy Elementary	-	2	
Hillcrest	10	5	
Howard Upper Elementary	35	2	Hallways are the only primary shelter areas
Lake Weir High	400	20	Possible problems with parking outside of lot

TABLE 2-8

VEHICLE CAPACITY AND GENERAL COMMENTS: MARION COUNTY (cont'd)

Shelter Name	Vehicle Capacity		General Comments
	# Parking Spaces	Potential Acres	
Lake Weir Middle	1	15-20	
Madison Street Primary	-	1	
Marion Educational Resource Center	-	-	
North Marion High	-	-	
North Marion Middle	-	20	
Oakcrest Elementary	40	15	Use of cafeteria and stage only in extreme emergency
Reddick-Collier Elem.	-	-	
Sparr Elementary	30	1/2	
Stanton-Weirsdale Elem.	35	5	
Vanguard High	-	-	
Wyomina Park Elementary	-	-	

Source: Withlacoochee Regional Planning Council staff, Marion County, Shelter Inventory, March, 1982.

TABLE 2-9

SUMTER COUNTY PRIMARY SHELTER CHARACTERISTICS

Shelter	Independent Power	Independent Water	Sewage Septic/Sewer	Kitchen Gas/Electric
Bushnell Elementary School	No	No	Septic	Electric
North Sumter Intermediate School	No	No	Sewer	Electric
North Sumter Primary School	No	No	Sewer	Gas
South Sumter High School	Yes, Whole School	Yes	Septic	Electric
South Sumter Middle School	No	Yes	Septic	Gas
Webster Elementary School	No	Yes	Septic	Gas
Wildwood High School	Yes, Whole School	No	Sewer	Electric
Wildwood Middle School	No	No	Sewer	Electric

Source: WRPC staff, Sumter County Shelter Inventory, March, 1982.

TABLE 2-10

SUMTER COUNTY SHELTERS: VEHICLE CAPACITY AND
GENERAL COMMENTS

Shelter	Vehicle Capacity		Comments
	Acres	Parking Spaces	
Bushnell Elementary School	-	100	
North Sumter Intermediate School	5	50	
North Sumter Primary School	5	60	
South Sumter High School	4	150	All classrooms have small windows
South Sumter Middle School	-	25	Drainage problems
Webster Elementary School	3	50	Septic problems
Wildwood High School	3	-	
Wildwood Middle School	8	50	

Source: Withlacoochee Regional Planning Council staff, Sumter County Inventory, March, 1982.

TABLE 2-11
SHELTERS WITH EMERGENCY
ELECTRICAL POWER

<u>Marion County</u>	<u>Capacity</u>
Forest High	1,672
Ft. McCoy Elementary	265
North Marion Middle	3,896
<u>Sumter County</u>	
South Sumter High School	1,692
Wildwood High School	<u>1,532</u>
TOTAL	9,057

TABLE 2-12

SHELTER REQUIREMENTS
Withlacoochee Inland Region

Regional Scenario ^{1/}	Inland Counties Primary Shelter Capacity (20 sq. ft./person)	Shelter Bound Evacuees Entering the Withlacoochee Region From the Tampa Region ^{3/} /Requiring Public Shelter ^{2/}	Inland County Residents Requiring Public Shelter ^{2/}	Estimated Shelter Requirements
1	35,736	28,370	22,527	50,897
2	35,736	36,800	22,527	59,327
3	35,736	35,597	22,527	58,124
4	35,736	17,437	22,527	39,964
12	35,736	22,544	22,527	45,071

^{1/}Regional Scenarios represent the worst probable storm event for each county in the Tampa Bay Region based upon the SLOSH hurricane simulation. Scenarios 1, 2, 3 and 4 are storm tracks striking the coast, with scenario 12 representing conditions created by a paralleling storm. Regional Scenarios are fully described in Appendix B.

^{2/}Of the 41,872 persons at risk in the inland counties, 53.8% are expected to seek public shelter. The remaining persons at risk are expected to go to a friends home (18.5%), or a hotel/motel (27.7%).

^{3/}It is estimated that 16,793 persons entering the Withlacoochee Region will seek public shelter in the coastal counties of Levy, Citrus and Hernando. The numbers shown here are for the Tampa Bay evacuees reaching the inland counties - less those seeking shelter in the coastal Withlacoochee counties.

TABLE 2-13
Shortfall in Shelter Capacity - Inland Counties

Regional Scenario	Inland Counties		Estimated Shelter Requirements	Shortfall in Shelter Capacity
	Primary Shelter Capacity (20 sq. ft./person)			
1	35,736	50,897	15,161	
2	35,736	59,327	23,591	
3	35,736	58,124	22,388	
4	35,736	39,964	4,228	
12	35,736	45,071	9,335	

TABLE 2-14

SUMTER COUNTY ALTERNATE SHELTERS

<u>Secondary Shelter</u>	<u>Address</u>	<u>Capacity 20 sq. ft./person</u>
First Baptist Church	Creek Road & Hwy. 301, Oxford	264
First Baptist Church	SR 470, Lake Panasoffkee	150
First Baptist Church	1st Avenue & 2nd Street, Webster	300
Church of Christ	507 Gamble Ave., Wildwood	236
First Baptist Church	Oxford St. & Mason Ave., Wildwood	1,000
First Baptist Church of God	124 W. Anderson Avenue, Bushnell	206
Bushnell Presbyterian Church	W. Dade Ave. and Broad St., Bushnell	97
First United Methodist Church	W. Noble Avenue, Bushnell	70
Wildwood United Methodist	308 North Mason St., Wildwood	100
First Baptist Church	P. O. Box 151, Center Hill	250
TOTAL		2,673

Source: Withlacoochee Regional Planning Council staff, Secondary Shelter Inventory, March, 1983.

TABLE 2-15

MARION COUNTY ALTERNATE SHELTERS

<u>Secondary Shelter</u>	<u>Address</u>	<u>Capacity 20 sq. ft./person</u>
First Baptist Church	S.E. 137th Ct. & 164th St., Weirsdale	175
United Methodist Church	N. Hwy. U.S. Alt. 441, Oklawaha	150
Weirsdale Presbyterian	N. Hwy. US Alt. 441, Weirsdale	300
First Baptist Church	525 Pine Road, Silver Springs Shores Ocala	350
First United Methodist Church	1126 E. Silver Springs Blvd., Ocala	200
Covenant Missionary Baptist Church	606 S.W. Broadway, Ocala	100
College Park Church of God	3140 S.W. 26th St., Ocala	272
Zion United Methodist	600 N.W. 16th Avenue, Ocala	30
St. Mark's United Methodist Church	1839 N.E. 8th Avenue, Ocala	200
St. Matthew's Lutheran	3453 N.E. Silver Springs Blvd., Ocala	40
Elks Club	2449 N.E. Silver Springs Blvd., Ocala	300
Oakcrest Baptist Church	1109 N.E. 28th St., Ocala	450
Central Christian Church	3010 N.E. 14th St., Ocala	500
Northside Missionary Baptist	2321 N.E. 11th St., Ocala	100
Ft. King Presbyterian Church	13 N.E. 36th Avenue, Ocala	150
First Christian Church	1908 S.E. Ft. King, Ocala	125

Table 2-15 (Cont.)

Central Baptist Church	1714 S.E. 36th Ave., Ocala	1,500
The Lord's Chapel	2111 N.E. 36th Ave., Ocala	180
St. Paul's United Methodist	4060 S.E. 8th St., Ocala	175
Grace Episcopal Church	503 S.E. Broadway, Ocala	90
Bible Baptist Church	349 S.E. Lake Weir Blvd., Ocala	50
Blessed Trinity Church	5 S.E. 17th St., Ocala	220
First Pentecostal Holiness Church	1845 S.W. 1st Ave., Ocala	170
Church of the Nazarene	5930 S.E. Robinson Rd., Belleview	350
Belleview United Methodist Church	5508 S.E. Brown Rd, Belleview	100
Temple B'nai Darom	Banyon Course, Ocala	320
First United Methodist	Ohio & Chestnut St., Dunnellon	350
Silver Springs Shores Presbyterian Church	674 Silver Road, Silver Springs Shores, Ocala	531
Oak Grinder Baptist Church	6422 Jacksonville Rd., Ocala	600
United Methodist Church	St. Hwy. 25A, Reddick	60
Flemington Baptist Church	St. Hwy. 329, Flemington	50
United Baptist Church	P. O. Box 456, Reddick	150
Church of Christ	2750 S.E. Maricamp Road, Ocala	200
Olivet Baptist Church	8495 S. Magnolia, Ocala	342
City Auditorium	836 N.E. Sanchez Ave., Ocala	338
Municipal Airport Passenger Terminal	1550 S.W. 60th Ave., Ocala	30
City Hall	151 S.E. Osceola Ave., Ocala	26
Golf Course #1 Clubhouse	3130 N.E. Silver Springs Blvd., Ocala	71
Library	15 S.E. Osceola Ave., Ocala	259

Table 2-15 (Cont.)

Library		
Lincoln St. Youth Center	1710 N.W. 10th St., Ocala	146
War Memorial Auditorium	1510 N.W. 4th St., Ocala	<u>262</u>
TOTAL		10,012

Source: Withlacoochee Regional Planning Council staff, Secondary Shelter
Inventory, March 1983.

TABLE 2-16

SUMTER COUNTY HOTELS/MOTELS

<u>Name of Structure</u>	<u>Number of Units</u>	<u>Meeting Room</u>	<u>Restaurant</u>
Best Western Guest House Motel	47	yes	yes
Days Inn America, Inc.	190	yes	yes
Days Inn (Sunshine Inn)	120	no	yes
Holiday Inn	136	--	--
United 500 Motel	45	no	yes

TOTAL HOTEL/MOTEL UNITS, SUMTER COUNTY: 538

Source: Sumter County Chamber of Commerce, June, 1982.

TABLE 2-17
MARION COUNTY HOTELS/MOTELS

OCALA			
<u>Name of Structure</u>	<u>Number of Units</u>	<u>Meeting Room</u>	<u>Restaurant</u>
Alamo Motel	26	No	No
Aloha Court	14	No	No
Boulevard Motel	14	No	No
Bridges Motel	14	No	No
Cloister Court	17	No	No
Coral Motel	12	No	No
Craft Motel	23	No	No
Cross Country Motor Lodge	7	No	No
Davis Bros. Motor Lodge	96	No	Yes
Days Inn Motel	140	No	Yes
Dement Motel	21	No	No
Dixie Motel	15	No	No
Econo-Lodge	100	No	Yes
Egret Motel	42	No	No
Family Inn Economy Motel	41	No	Yes
Fairways Motel	26	No	No
Flamingo Motel	23	No	No
French Court Motel	23	No	No
Friendly Village Inn	144	No	Yes
Golden Spur Motel	19	No	No
Hilltop Motel	13	No	No
Holiday Inn West	196	Yes	Yes
Holiday Motel	32	No	No
Hornes Motor Inn	100	No	Yes
Howard Johnson's	64	No	Yes
International Motel	20	No	No
Johnson's Motor Lodge	51	No	No
Journey's End Motel	25	No	No
Kazimra Motel	6	No	No
Magnolia Court	15	No	No
Mustang Motor Inn	60	No	No
Ocala Motel	14	No	No
Orange Blossom Motel	10	No	No
Palms Motel	22	No	No
Pan American Motel	20	No	No
Panorama Resort Inn	100	Yes	Yes
Quality Inn	121	Yes	Yes

TABLE 2-17(Cont.)

Ramada Inn	138	Yes	Yes
Red Carpet Inn	108	Yes	No
Scottish Inn	52	No	No
Shamrock Motel	12	No	No
Shangri La Motel	26	No	No
Shel-lyn Motel	12	No	No
Sheraton Motor Inn	100	Yes	Yes
Silver Princess Motel	25	No	No
Silver Springs Budget Motel	30	No	No
Silver Sands Motel	12	No	No
Southern Hotel Motor Lodge	39	No	No
Southland Motel	12	No	No
Southwood Motel	42	No	No
Spring Side Motel	28	No	No
Stage Stop Inn	75	No	Yes
Star Motel	13	No	No
Steven's Motel	16	No	No
Sun Days Motel	11	No	No
Sun Plaza Inn	48	No	No
Thunderbird Motel	48	No	No
Town and Country Quality Inn	125	Yes	Yes
Town Plaza Motel	14	No	No
Travelodge of Ocala	70	No	Yes
Tropical Court	16	No	No
Western Motel	23	No	No

BELLEVIEW

Silver Belle Motel	14	No	No
VIN-MAR Motel	10	No	No

DUNNELLON

Angler's Resort	9	No	No
Bass Galore Village	10	No	No
Davis Court	15	No	No
Dinner Bell Motel	16	No	Yes
Fish n' Fun Lodge	6	No	No
Lucky Landing Fish Resort	7	No	No

FT. MCCOY

Ponderosa Motel	4	No	No
-----------------	---	----	----

TABLE 2-17(Cont.)

ORANGE LAKE

Orange Lake Fishing Camp	10	No	No
Orange Lake Court	12	No	No
Pine Grove Cottages	9	No	No
Ranch Motel	14	No	No

CITRA

Orange Blossom Motel	10	No	No
----------------------	----	----	----

TOTAL HOTEL/MOTEL UNITS, MARION COUNTY: 2,927

Source: Ocala/Marion County Chamber of Commerce, May, 1982.

TABLE 2-18

INLAND COUNTY RESIDENTS' TENDENCIES

<u>Withlacoochee Inland Residents</u>	
EVACUATION RESPONSE	
Immediate	85.6% \pm 3.1%
Certain Number of Hours	12.6% \pm 2.9%
Never	1.8% \pm 1.2%
Average Number of the Certain number of hours ^{1/}	1.77
VEHICULAR USAGE	71.7%
NEED FOR TRANSPORTATION	3.6% \pm 1.6%
NEED FOR SPECIAL HELP	6.1% \pm 2.1%
DESTINATION	
Public Shelter	40.0% \pm 4.3%
Friend or Relative	13.7% \pm 3.0%
Hotel or Motel	20.6% \pm 3.6%
Don't Know	25.7% \pm 3.0%
PERCEPTION OF THREAT	
Yes	21.8% \pm 3.6%
No	59.4% \pm 4.3%
Maybe	18.8% \pm 3.4%

Source: H. W. Lochner, Inc. Behavioral Survey for the
Withlacoochee Regional Disaster Preparedness
Plan. June, 1982.

^{1/} The hourly range breakdown for evacuation response was
as follows:

<u>Hourly Range</u>	<u>Withlacoochee Inland Residents</u>
Less than 2	64.1%
2 or More, but Less than 3	29.5%
3 or More, but Less Than 4	3.8%
4 or More	2.6%

FIGURE 2-1

INVENTORY CRITERIA OF SECONDARY SHELTERS

I. GENERAL INFORMATION

A. Name of Structure _____

B. Address _____

C. Telephone Number _____

D. Type of Structure _____

E. Contact Person _____

II. BUILDING CONSTRUCTION CHARACTERISTICS

A. Exterior Walls _____

B. Percent Square Footage of Windows _____

III. SHELTER CAPACITY

A. CRP Listing _____

B. Owner Estimate _____

IV. COMMENTS

**MAP 2-1
Sumter County
Shelter Locations**

- S1 - Wildwood Middle School*
- S2 - North Sumter Primary*
- S3 - Wildwood High School*
- S4 - North Sumter Intermediate School*
- S5 - South Sumter High School*
- S6 - South Sumter Middle School
- S7 - Webster Elementary School
- S8 - Bushnell Elementary*

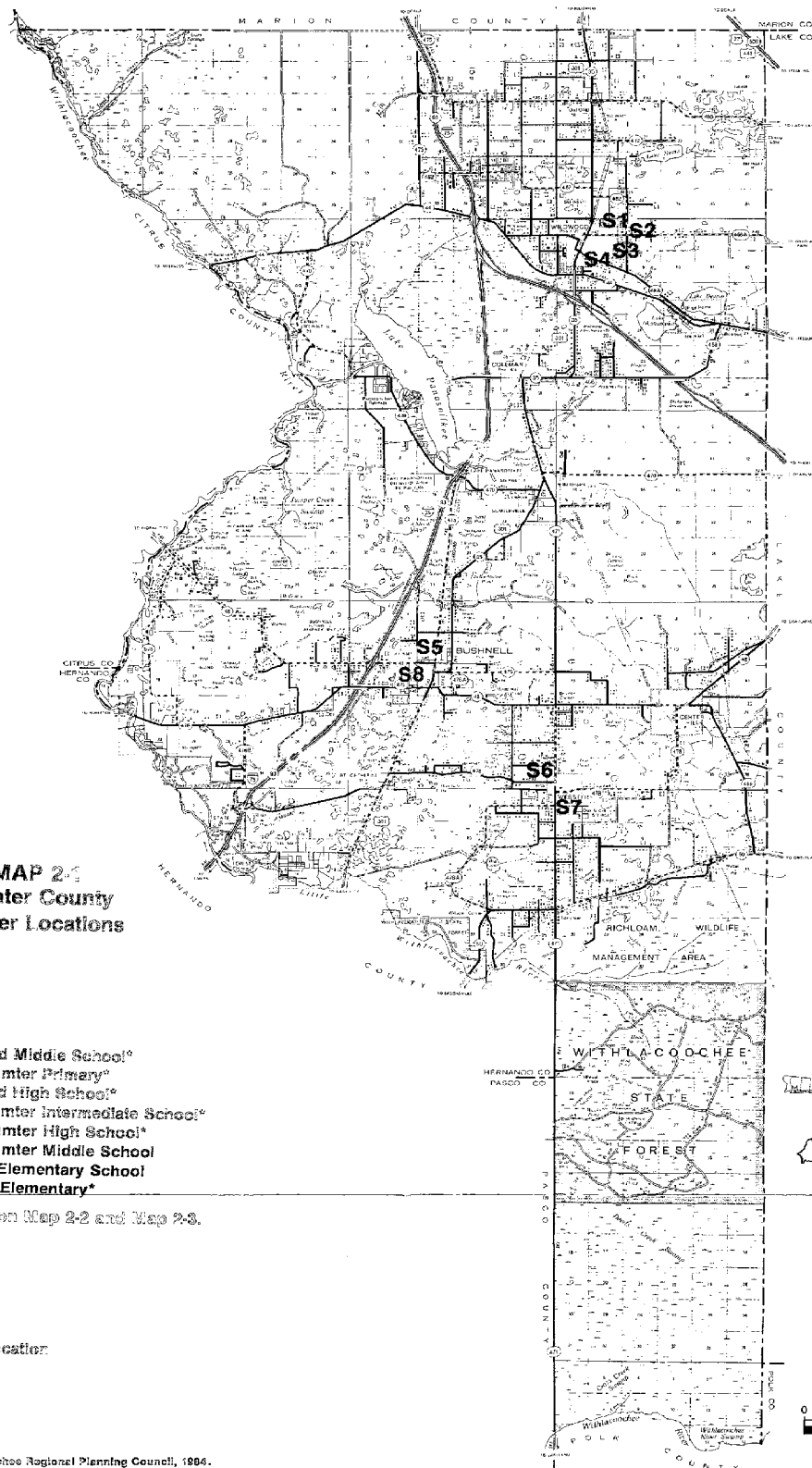
*Also shown on Map 2-2 and Map 2-3.

LEGEND:
S1 Shelter Location

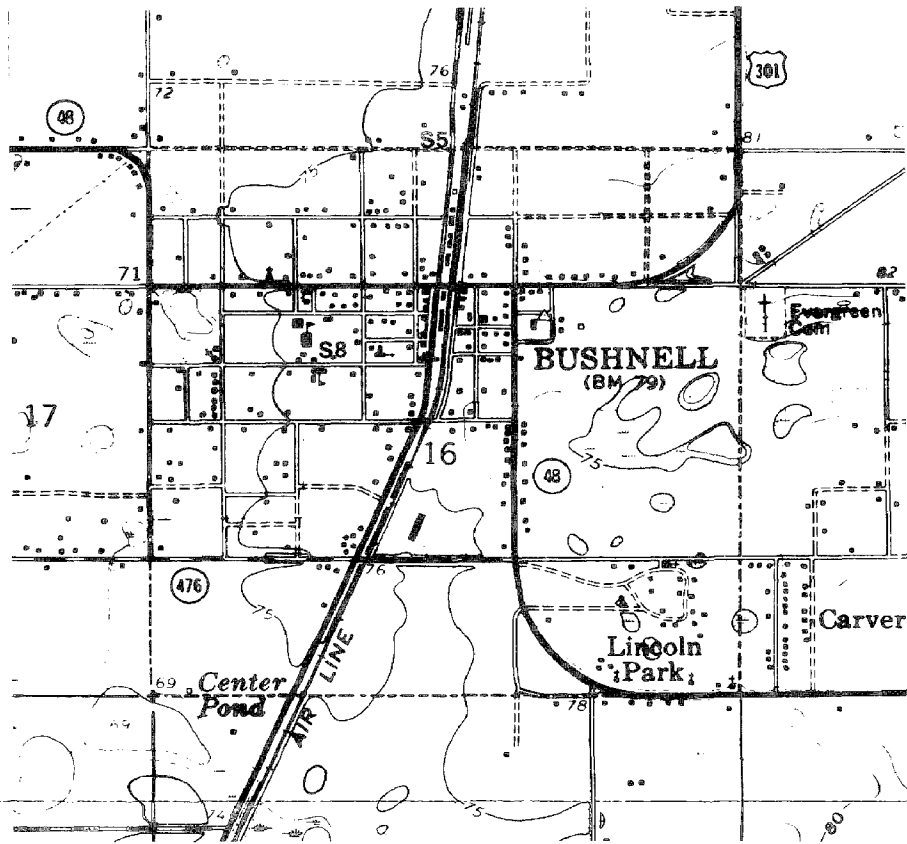
SOURCE: Withlacoochee Regional Planning Council, 1984.

Base map prepared by the
Florida Department of Transportation
Graphics and reproduction prepared by the
Withlacoochee Regional Planning Council

**SUMTER COUNTY
FLORIDA**



MAP 2-2
City of Bushnell
Shelter Locations



LEGEND:

S5 Shelter Location

S5 - South Sumter High School

S8 - Bushnell Elementary

SOURCE: Withlacoochee Regional Planning Council, 1984.

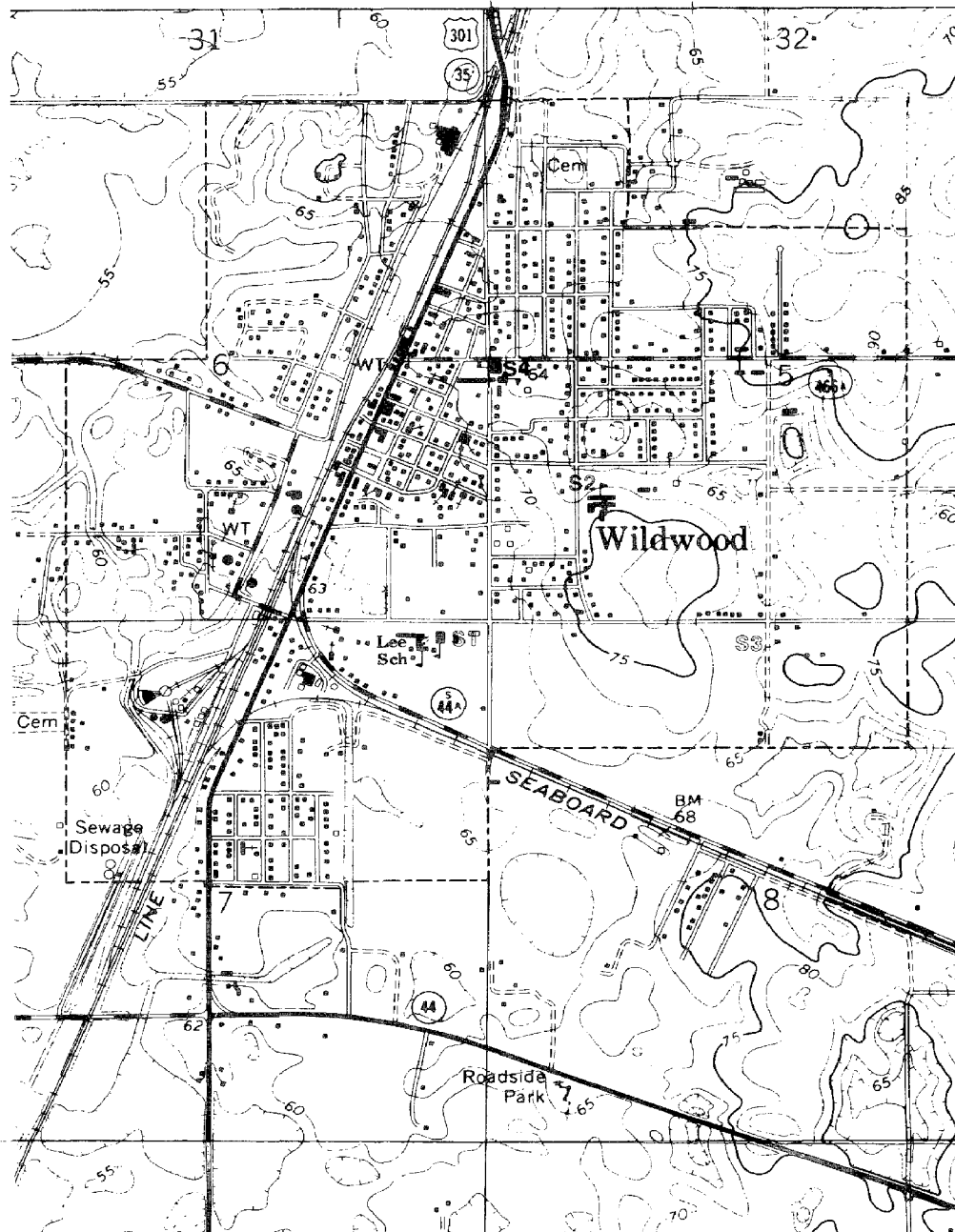
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Geological Survey
Topographic Quadrangle Series
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Withlacoochee Regional Planning Council



0 500 1000 2000 FEET

CITY OF BUSHNELL
FLORIDA

MAP 2-3
City of Wildwood
Shelter Locations



LEGEND:

S1 Shelter Location

- S1 - Wildwood Middle School
- S2 - North Sumter Primary
- S3 - Wildwood High School
- S4 - North Sumter Intermediate School

SOURCE: Withlacoochee Regional Planning Council, 1984

Base map prepared by the
United States Department of the Interior
Geological Survey
Topographic Quadrangle Series
Graphics and reproduction prepared by the
Withlacoochee Regional Planning Council



CITY OF WILDWOOD
FLORIDA

NOTE: Shelters located in the City of Ocala are shown on Map 2.5.

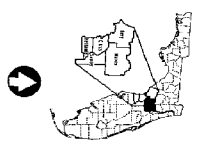
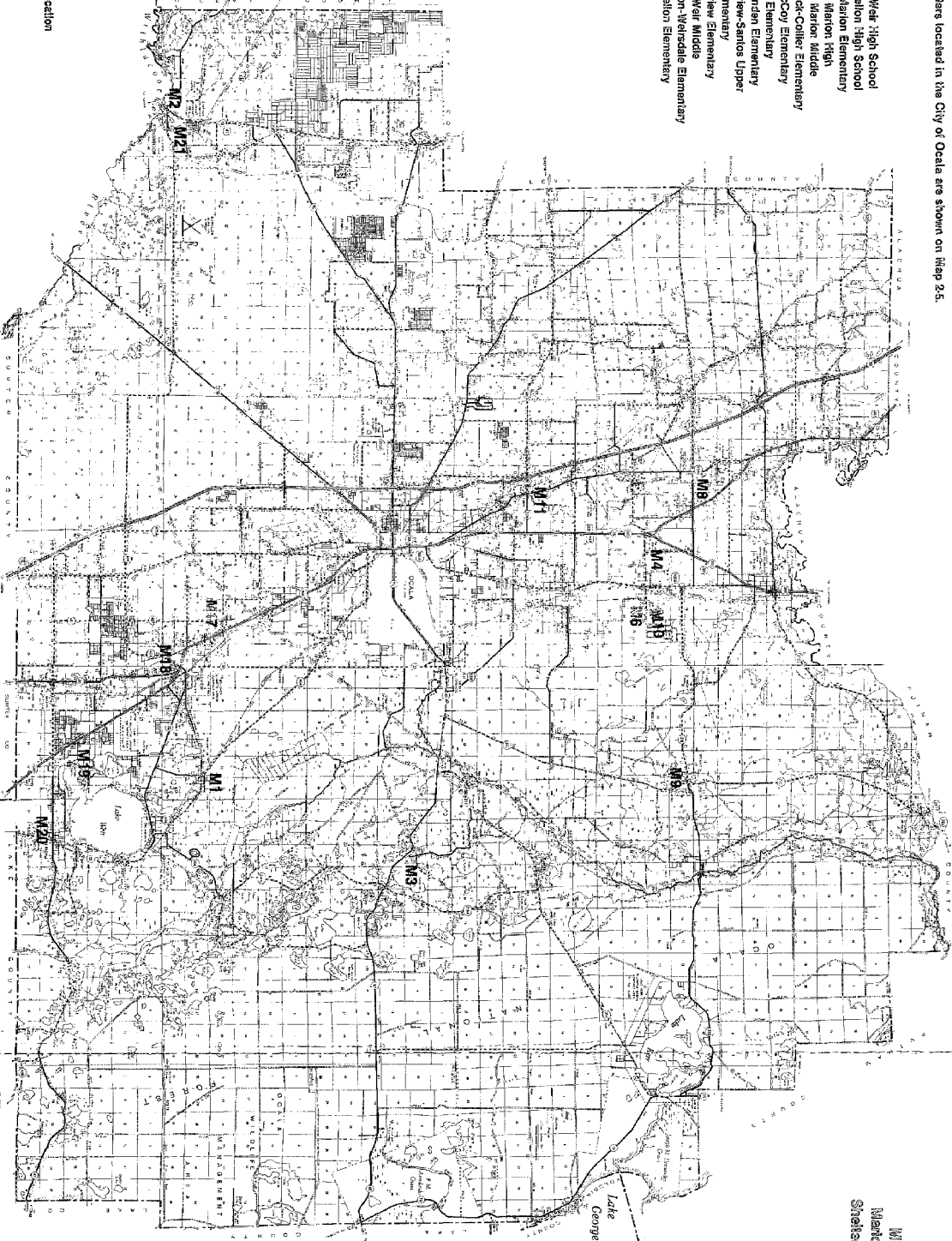
- M1 - Lake Weir High School
- M2 - Dunnellon High School
- M3 - East Marion Elementary
- M4 - North Marion High
- M5 - North Marion Middle
- M6 - Reddick-Coker Elementary
- M7 - Sparr Elementary
- M8 - Fassenden Elementary
- M9 - Bellevue-Santos Upper Elementary
- M10 - Bellevue Elementary
- M11 - Lake Weir Middle
- M12 - Stanton-Weisdale Elementary
- M13 - Dunnellon Elementary

LEGEND:
M1 Shelter Location

SOURCE: Withaloochee Regional Planning Council, 1984.

Map prepared by the
Planning Department of Marion County
Geographic Information Systems
Withaloochee Regional Planning Council

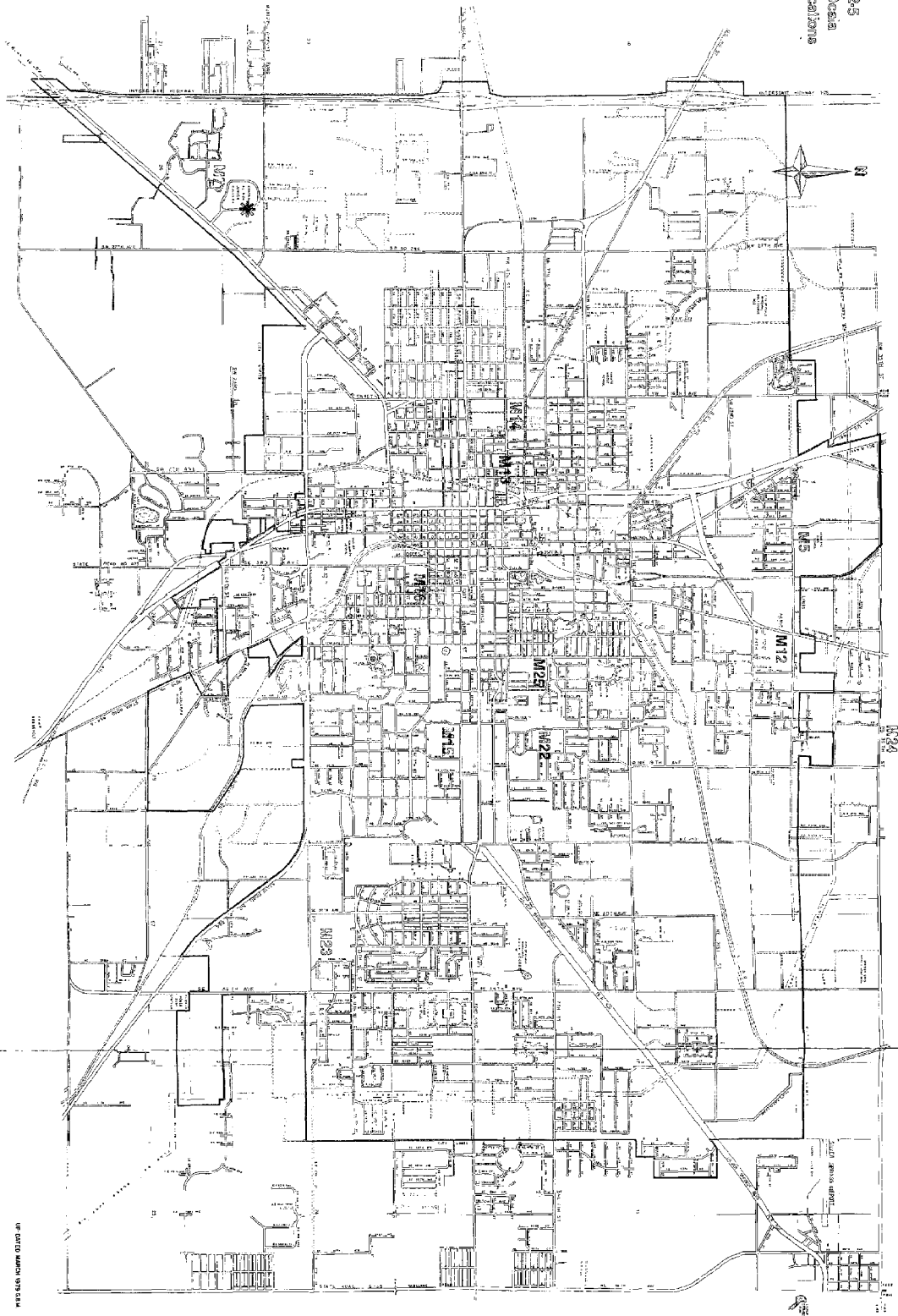
MAP 2.4
Marion County
Shelter Locations



MARION COUNTY
FLORIDA

CITY OF OCALA FLORIDA

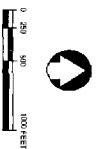
MAP 2-5
City of Ocala
Shelter Locations



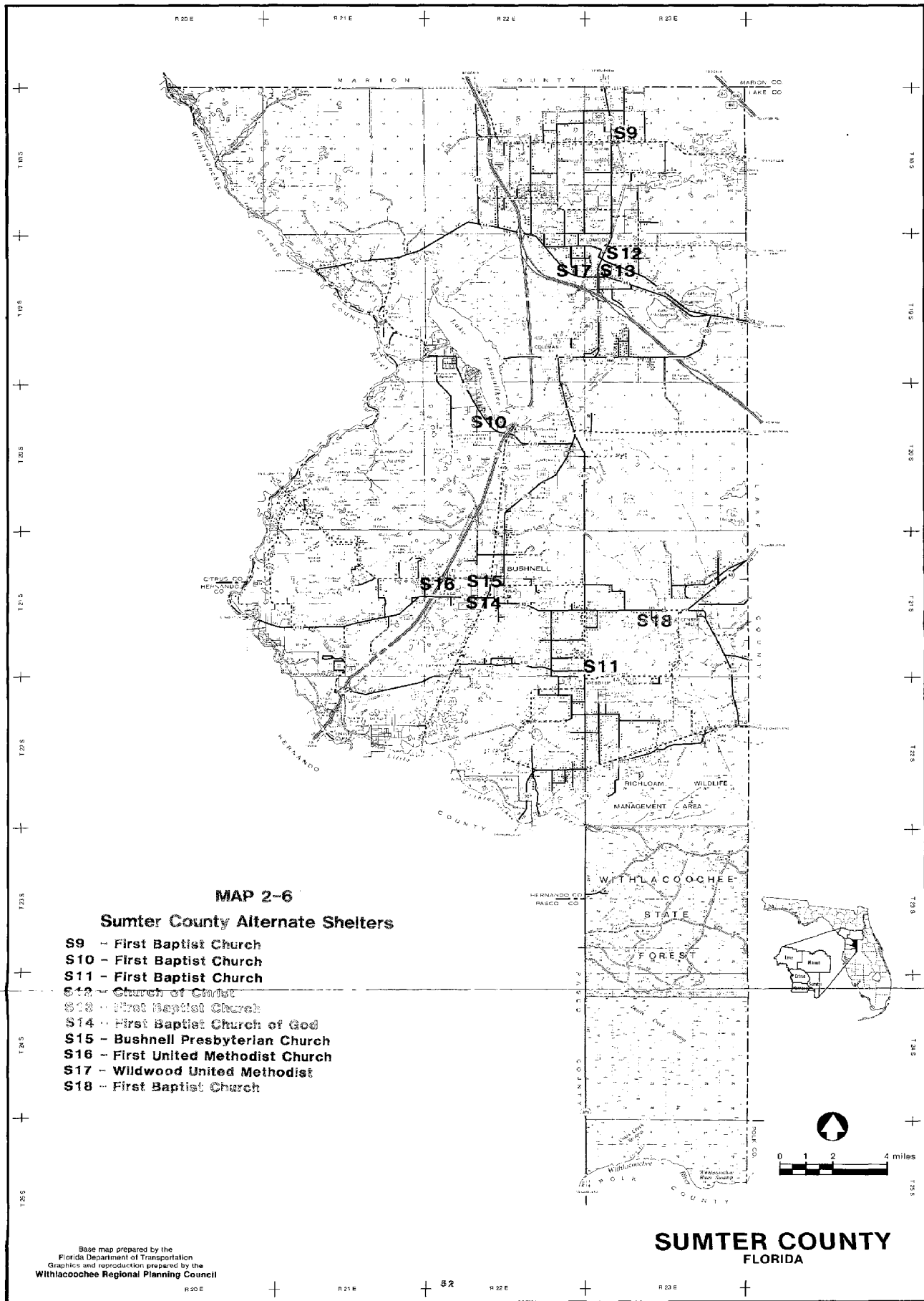
Map was prepared by the
City of Ocala Engineering Department
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United States Regional Planning Council

SOURCE: United States Regional Planning Council, 1961.

- LEGEND:**
- M1 - Veterans' Section
 - M2 - Veterans' Center
 - M3 - Veterans' High
 - M4 - Veterans' Park Elementary
 - M5 - Veterans' Elementary
 - M6 - Veterans' Upper Elementary
 - M7 - Veterans' Street Primary
 - M8 - Veterans' Middle School
 - M9 - Veterans' School
 - M10 - Veterans' Education Resource Center
 - M11 - Veterans' Park Elementary
 - M12 - Veterans' High School
 - M13 - Veterans' High School
 - M14 - Veterans' High School
 - M15 - Veterans' High School
 - M16 - Veterans' High School
 - M17 - Veterans' High School
 - M18 - Veterans' High School
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 - M96 - Veterans' High School
 - M97 - Veterans' High School
 - M98 - Veterans' High School
 - M99 - Veterans' High School
 - M100 - Veterans' High School



1/2" = 100' MARCH 1971 E&A



MAP 2-6

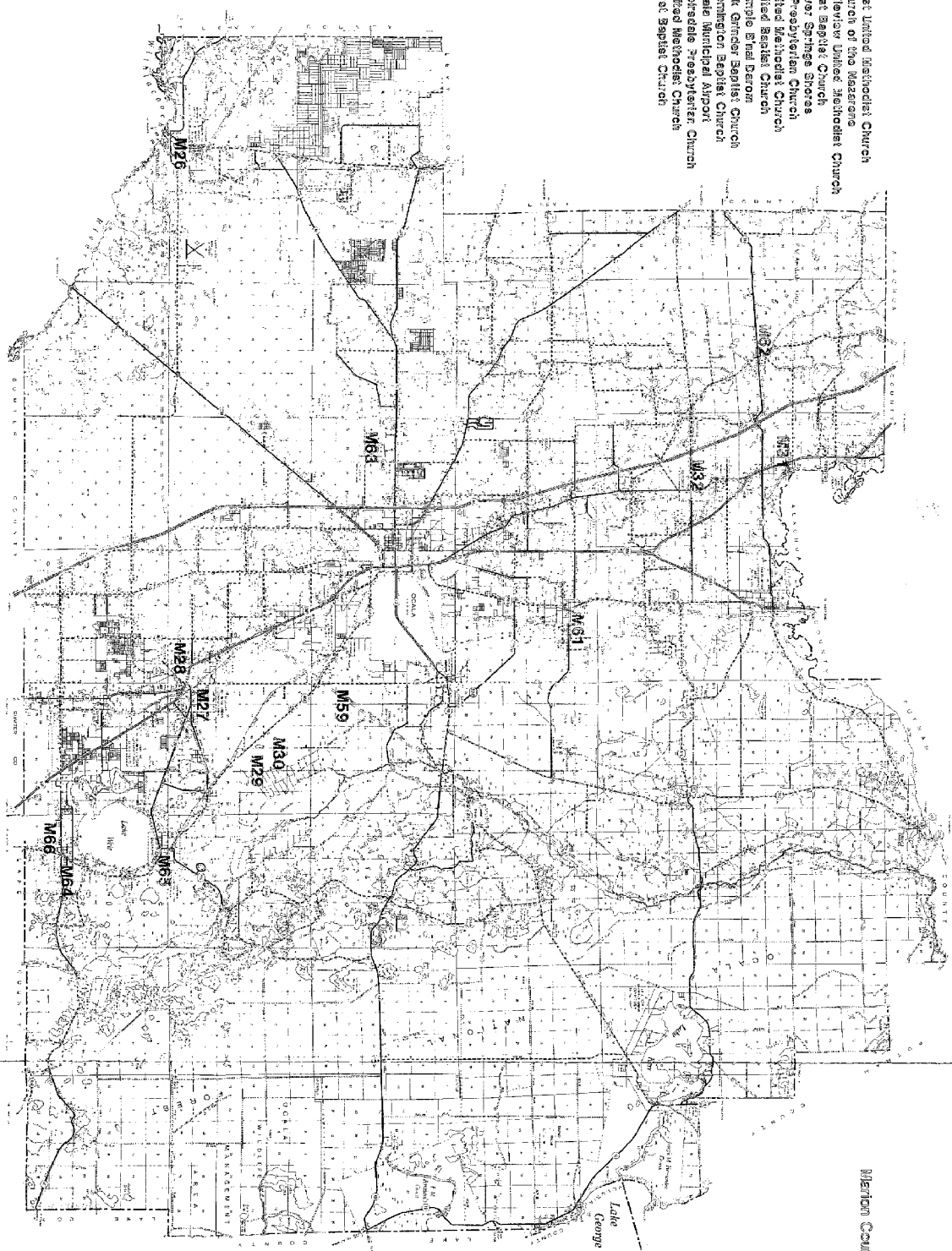
Sumter County Alternate Shelters

- S9 - First Baptist Church**
- S10 - First Baptist Church**
- S11 - First Baptist Church**
- S12 - Church of Christ**
- S13 - First Baptist Church**
- S14 - First Baptist Church of God**
- S15 - Bushnell Presbyterian Church**
- S16 - First United Methodist Church**
- S17 - Wildwood United Methodist**
- S18 - First Baptist Church**

Base map prepared by the
Florida Department of Transportation
Graphics and reproduction prepared by the
Withlacoochee Regional Planning Council

SUMTER COUNTY
FLORIDA

- M29 - First United Methodist Church
- M27 - Church of the Nazarene
- M28 - Bellevue United Methodist Church
- M29 - First Baptist Church
- M30 - Shree Springs School
- M31 - Presbyterian Church
- M32 - United Methodist Church
- M33 - United Baptist Church
- M34 - Temple Emanuel
- M35 - Oak Grange Baptist Church
- M36 - Flemington Baptist Church
- M37 - Ocala Municipal Airport
- M38 - Weirsdale Presbyterian Church
- M39 - United Methodist Church
- M40 - First Baptist Church



Map prepared by the
Florida Department of Transportation
for the Marion County
Waterways Regional Planning Council

MARION COUNTY
FLORIDA

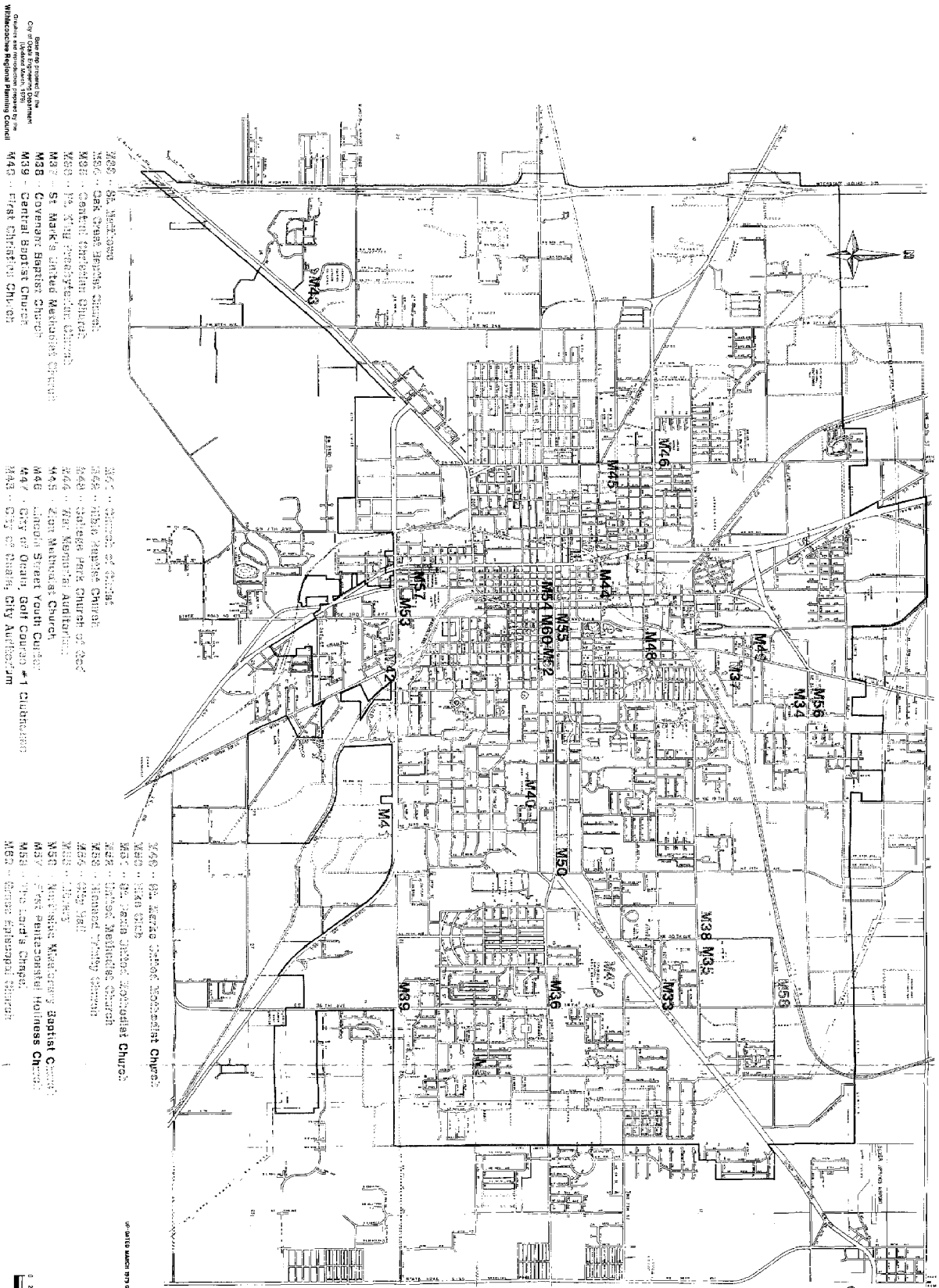


MAP 2-7
Marion County Alternate Spellers

CITY OF OCALA

FLORIDA

MAP 2-3
City of Ocala Alternate Shelters



Map prepared by the
City of Ocala Engineering Department
Graphics and reproduction prepared by the
Wilcoxon Regional Planning Council

M40 - Church of Christ
M41 - Hills Baptist Church
M42 - College Park Church of God
M43 - Oak Mountain Auditorium
M44 - Zion Methodist Church
M45 - Church Street Youth Center
M46 - City of Ocala, Gulf County #1 Clubhouse
M47 - City of Ocala, City Auditorium
M48 - Church of Christ
M49 - Hills Baptist Church
M50 - College Park Church of God
M51 - Oak Mountain Auditorium
M52 - Zion Methodist Church
M53 - Church Street Youth Center
M54 - City of Ocala, Gulf County #1 Clubhouse
M55 - City of Ocala, City Auditorium
M56 - Church of Christ
M57 - Hills Baptist Church
M58 - College Park Church of God
M59 - Oak Mountain Auditorium
M60 - Zion Methodist Church
M61 - Church Street Youth Center
M62 - City of Ocala, Gulf County #1 Clubhouse
M63 - City of Ocala, City Auditorium
M64 - Church of Christ
M65 - Hills Baptist Church
M66 - College Park Church of God
M67 - Oak Mountain Auditorium
M68 - Zion Methodist Church
M69 - Church Street Youth Center
M70 - City of Ocala, Gulf County #1 Clubhouse
M71 - City of Ocala, City Auditorium
M72 - Church of Christ
M73 - Hills Baptist Church
M74 - College Park Church of God
M75 - Oak Mountain Auditorium
M76 - Zion Methodist Church
M77 - Church Street Youth Center
M78 - City of Ocala, Gulf County #1 Clubhouse
M79 - City of Ocala, City Auditorium
M80 - Church of Christ
M81 - Hills Baptist Church
M82 - College Park Church of God
M83 - Oak Mountain Auditorium
M84 - Zion Methodist Church
M85 - Church Street Youth Center
M86 - City of Ocala, Gulf County #1 Clubhouse
M87 - City of Ocala, City Auditorium
M88 - Church of Christ
M89 - Hills Baptist Church
M90 - College Park Church of God
M91 - Oak Mountain Auditorium
M92 - Zion Methodist Church
M93 - Church Street Youth Center
M94 - City of Ocala, Gulf County #1 Clubhouse
M95 - City of Ocala, City Auditorium
M96 - Church of Christ
M97 - Hills Baptist Church
M98 - College Park Church of God
M99 - Oak Mountain Auditorium
M100 - Zion Methodist Church



CHAPTER III EVACUATION

Introduction

This chapter will use the information provided in the previous chapters of this report to develop a plan for interregional evacuation of at-risk residents. The goal of this plan is to incorporate local plans into an effective inter-regional plan for the evacuation and sheltering of both coastal and inland area residents threatened by hurricane conditions. To accomplish this goal, the evacuation plan will: (1) define the routes that should be taken by evacuating residents to areas of public shelter, (2) assign evacuees to specific reception centers where shelter assignments will be made, (3) identify traffic control points to be established to facilitate orderly movement of traffic to areas of safety.

The evacuation plan is broken into two major elements: the inland evacuation element and the coastal evacuation element. The maps and tables discussed in the narrative are grouped in sequence following the narrative for ease of reading and cross reference.

Inland Evacuation Element

The evacuation of inland areas will be required for persons residing in structures subject to hurricane hazards. Mobile home residents are to be evacuated due to high wind vulnerability.

Evacuation Zones - In order to conduct the transportation analysis, evacuation zones have been designated. By using these geographic units, it is possible to state which people should evacuate for a particular vulnerability level and to describe traffic movements from one geographic area of a county to another. A series of evacuation zones was established for each county based upon the following factors:

- (1) coincidence with flooding limits for the A and B vulnerability levels;
- (2) direct relation to census divisions for an established population base;
- (3) use of easily recognizable and topographic features for identification of zonal boundaries;
- (4) consideration of population densities and locations in terms of major east-west arterial roadways.

The evacuation zones for Marion and Sumter counties are presented in Map 3-3 and 3-4. The at-risk population in the inland counties are mobile home residents and may require evacuation under a "A" or "B" level storm situation.

In order to determine the routing of evacuation traffic, a representation of the evacuation network roadway system was developed. A traditional "link-node" system was developed to identify roadway sections. Nodes are used to identify the intersection of two roadways or changes in roadway characteristics. Links are the roadway segments as defined by the nodes when connected. Each link is identified by a pair of node numbers. Another type of node, represented by an open circle, identifies the geographic center of activity within an evacuation zone. When connected to the evacuation network by a dashed line, these points indicate where evacuating vehicles enter the network. Maps 3-1 and 3-2 provide the representation of the evacuation network used in each county for transportation analysis.

Once the links and nodes for the evacuation routes were identified, roadway characteristics were specified for each link. The characteristics of each link were defined by the following features.

- Number of travel lanes;
- Type of facility (e.g., freeway, collector, local street);
- Area type (e.g., residential area, rural area)

The number of travel lanes has the greatest effect on the ability of a roadway segment to handle a certain number of vehicles per hour. The type of facility refers to a link's designation as a one-way street, collector (undivided or divided), arterial, freeway, or centroid connector (local street). Area type designates the major land use characteristics surrounding the link and includes central business district, outlying business district, fringe area, residential area and rural area. The significance of these link characteristics is defined by their use as indicators of roadway speed and capacity.

Evacuation Routes - The evacuation routes for Marion and Sumter counties are presented in Tables 3-1 and 3-2. These tables define the inland routing of evacuees from one evacuation zone to another.

In choosing roadways to be used in the evacuation network an effort was made to include only street facilities with sufficient elevation, little or no adjacent tree coverage, and substantial shoulder width and surface. Another objective was to provide east-west arterials and route combinations that would provide the smoothest (least disjointed) possible traffic flow. In selecting major north-south arterials, U.S. 41, U.S. 301, I-75 and the Florida Turnpike were incorporated as major regional movers of traffic.

Evacuation on this roadway network will require that all evacuation vehicles are off the roadway before hazardous conditions arrive. This assumption is used in the calculation of evacuation clearance times.

Another important assumption in the use of the evacuation network is that special manpower will be assigned to critical intersections on the network. This will consist of local and state law enforcement officials who would monitor and direct traffic to create a smoother traffic flow.

Shelter Assignment - The goal of shelter assignment in the inland evacuation is to provide for the most efficient movement of evacuees to the closest available shelter. The transportation analysis provides a description of the most efficient routes to shelter from one zone to another. This information is presented in tables 3-1 and 3-2 for the inland counties.

Shelter assignment is a three step process. First, evacuees are routed along the routes described in the transportation analysis. This is a movement from evacuation zone to a destination zone. Second, an initial assignment of evacuees is made at the reception center in that destination zone. (If no reception center is present in that zone, another one should be designated.) Third, when the reception center has reached capacity more shelters are opened on an as needed basis. This system would minimize evacuee travel time and allow preparedness officials to open shelters as they are needed.

Under this system, all potential evacuees will have a pre-designated reception center assigned to them based upon the evacuation zone in which they reside. Once they reach their designated reception center, they will be assigned to a specific shelter facility by emergency personnel using this plan as a guide. The pre-designated reception centers for each evacuation zone are presented in Tables 3-3 and 3-4.

Traffic Control Points - To facilitate the orderly and efficient movement of evacuees, traffic control points have been designated by local officials. It is recommended that specific assignment of emergency traffic control manpower to critical traffic control points within the evacuation road network be incorporated into each county's hurricane emergency operations plan. Recommended traffic control points are presented on the evacuation network maps 3-1 and 3-2. Recommended traffic control points are shown as nodes on these maps.

Coastal Evacuation Element

An evacuation of coastal residents at-risk due to the surge hazard may be necessary for areas of the Withlacoochee and Tampa Bay region depending on the track of the hurricane. Since sufficient public shelter is present for coastal Withlacoochee area residents within the coastal counties, no impact on the inland county public facilities is anticipated from this group.

The components of evacuation in a West Coast case are inland county residents at-risk and persons evacuating from the Tampa Bay area. The evacuation of inland county residents is described in the Inland Evacuation Element in this chapter. Inland residents are first assigned to a reception center, then to a primary shelter. Assuming that all the primary spaces are taken by local residents, the Tampa Bay residents will be assigned to secondary shelters. The evacuation of both of these groups may be required by the hazard conditions of a storm paralleling the west coast of Florida.

West Coast

Evacuation Zones - The evacuation zones designated in the inland evacuation element are also used in the coastal evacuation element and are shown on Map 3-3 and 3-4.

Evacuation Routes - The three major coastal evacuation routes that have been identified are: U.S. 41; U.S. 301; and Interstate 75. This analysis will focus on U.S. 301 and Interstate 75. Shelter assignment of evacuees on U.S. 41 is covered in the Hurricane Evacuation Plan for Levy, Citrus and Hernando counties. It is assumed that the Rt. 19 will not be used as an evacuation route because of its location in the surge area.

The greatest coastal demand for inland public shelter is from an evacuation of the Tampa Bay Region. Since shelters are generally opened on a "as-needed" basis, this report will consider routing procedures as they apply to the worst probable hurricane event. Storm events of lesser intensity will require fewer shelter openings and fewer evacuation routes.

The Bureau of Emergency Management has provided an indication of the expected demand for shelter from the Tampa Bay area evacuation. The methodology and results of this analysis is presented in Appendix B. An estimated 53,593 persons desiring shelter are expected to travel on three routes into the Withlacoochee region.

Shelter Assignment - Evacuees from Tampa Bay will be directed to a reception center in the host county and directed from there to a secondary shelter. When the secondary shelters reach capacity, the civil defense director will instruct those seeking shelter to pass through to other areas.

Traffic Control Points - Traffic control points identified on Maps 3-1 and 3-2 will also be used in a coastal evacuation.

East Coast

An unknown number of evacuees seeking shelter will enter the inland counties as a result of an east coast evacuation. These evacuees will be directed to the nearest reception center for assignment to shelter. If storm conditions require an inland evacuation, inland residents will be directed to Primary shelters, and coastal residents will be directed to Secondary shelters. If no inland evacuation is required, entering evacuees seeking shelter will be directed to either Primary or Secondary shelters at the discretion of the local government. Traffic control points would be activated as needed to ensure smooth traffic movement.

Evacuation Times Element

Evacuation time consists of two components. The first is the pre-landfall hazard time which consists of the amount of time before the onset of gale force winds. The second component is the clearance time which is defined as the amount of time required for those persons vulnerable to hurricane hazards to reach their shelter destinations. The sum of these two components is evacuation time. Each of these components is addressed below.

Pre-Landfall Hazard Times

Gale Force Winds

The amount of time before the occurrence of gale force winds is determined by a comparison of the minimum gale force wind speed, assumed to be 40 mph, with the peak hourly wind speeds generated by SPLASH for each storm type and intensity. The number of hours before landfall at which a peak wind speed of 40 mph occurs is the pre-landfall hazard time for gale force winds.

The following is a summary of the pre-landfall hazard times for each vulnerability level:

<u>Vulnerability Level</u>	<u>Pre-Landfall Hazard Time</u>
A	4.0 - 5.5 hrs.
B	6.0 - 9.5

The aforementioned pre-landfall hazard times were based on the input storm parameters for the hurricanes generated by SPLASH. Should the actual storm parameters, as determined by monitoring the approaching storm, differ from the SPLASH parameters, the pre-landfall times may change. The purpose of this section, then, is to address how sensitive the pre-landfall hazard times are to changes in storm parameters.

The parameters in the SPLASH model which can affect the arrival of gale force winds and thereby pre-landfall hazard times are the forward speed of the storm and the radius to maximum winds.^{1/} As the storm speed increases, there is less time required for the arrival of gale force winds, thereby reducing pre-landfall hazard time. As the radius-to-maximum winds increases, gale force winds arrive sooner, thereby increasing pre-landfall hazard times.

In order to ascertain the sensitivity of pre-landfall hazard times to the aforementioned, additional SPLASH program runs were made. Forward speed and radius-to-maximum winds were independently varied in each additional run. This information shall be presented to local decision-makers to permit adjustments in evacuation times.

^{1/}The principal variable which governs wind speed is the change in barometric pressure which, in turn, is the basis for the different intensities on the Saffir/Simpson scale. The parameters herein referred to are those which can vary with each intensity category.

Clearance Times

Clearance time is the amount of time it takes for those persons vulnerable to hurricane hazards to reach their shelter destinations. A four-step procedure was used to calculate the clearance times.

First, the number of vehicle trips generated by each evacuation zone were calculated using the average number of vehicles per household for each county.

Second, the number of trips generated by each evacuation zone were distributed according to shelter destination. For public shelter, this destination consisted of manually matching shelter demand with shelter capacity in each county. For friend or relative destinations, a gravity model was used to distribute trips. In the case of hotel/motel destinations, a manual match was used; however, since the demand for hotel/motels greatly exceeded county hotel/motel capacity, a portion of these trips were routed out of the region.

The third and fourth steps consisted of assigning the distributed trips on the evacuation network and determining which link in the network had the highest ratio of traffic volume to roadway capacity. This link was termed the "critical link". The amount of travel time it takes for the last vehicle on the critical link to reach the county line is the clearance time.

In the case of both the Withlacoochee and Tampa Bay regions simultaneously evacuating, the Tampa Bay evacuees were added to the roadway network. The number of vehicles from the Tampa Bay expected to enter the Withlacoochee region via U.S. 41, U.S. 301 and I-75 were allocated to remaining primary shelter capacity and to secondary shelters in the region until all shelter capacity was utilized. The remaining vehicles were allocated to I-75 north and out of the region.

Clearance times for regional scenarios A and B, with and without Tampa Bay evacuees, are presented in Table 3-5 for each county. It can be seen that the clearance times in Hernando, Marion and Sumter Counties are greatly increased with a Tampa Bay evacuation.

Evacuation Times

Evacuation times are simply the sum of the clearance and pre-landfall hazard times and are presented in tables 3-6 and 3-7. The range of time is accounted by the differences in pre-landfall hazard times.

TABLE 3-1
SUMTER COUNTY EVACUATION ROUTES TO PUBLIC SHELTER

S01 to S03	S02 to S03	S03 to S03	S04 to S03	S05 to S07	S06 to S10	S07 to S07	S08 to S07	S09 to S10	S10 to S10
S100	S103	N/A	S105	S110 or S106 or S106	S109 or S109	N/A	S116	S117 or S117	N/A
S101	S120		S104	S111 S107 S108	S113 S113		S112	S116 S116	
S102			S120	S112 S111 S112	S114 S115			S112 S112	
S104				S112	S118			S113 S113	
S120								S114 S115	
								S118	

NOTE: The column headings are evacuation zones (origin and destination). The numbers in each column are the numbers assigned to the links on the evacuation network. See maps 3-1 and 3-4.

SOURCE: Post, Buckley, Schuh & Jernigan, August, 1983.

TABLE 3-2
MARION COUNTY EVACUATION ROUTES TO PUBLIC SHELTER

M01 to M03	M02 to M02	M03 to M03	M05 to M05	M06 to M05	M07 to M14	M08 to M08	M09 to M09	M10 to M14	M11 to M03	M12 to M12	M12 to M14	M14 to M14
M128 or M100	N/A	N/A	N/A	M105 or M106	M112	N/A	N/A	M117 or M117	M118	M124 or M123	M121	N/A
M129 M101				M107 M107	M111			M119 M119	M119	M122 M122	M121	
M127 M109				M108 M108	M110			M120 M120	M120	M120 M120	M110	
M126 M110				M121 M121				M121 M121	M121	M121 M121		
M125 M125				M120 M120				M110 M110	M110	M110 M110		
				M122 M122				M111 M111	M125	M125 M125		
				M123 M123				M112 M112				
								M113 M113				

NOTE: The column headings are evacuation zones (origin and destination). The numbers in each column are the numbers assigned to the links on the evacuation network. See maps 3-2, 3-3.

TABLE 3-3

SUMTER COUNTY RECEPTION CENTERS

<u>Location</u>	<u>Evacuation Zone</u>	<u>Access From Major Evacuation Routes</u>
Sumter County Fairgrounds SR 471 1 Mile North of Webster on SR 471	S10	U.S. 301, S.R. 48, South on 471
Sumter County Courthouse No. Florida Ave., Bushnell	S7	I-75, S.R. 476 or U.S. 301, Bushnell
Lake/Sumter Mental Health Center Hwy. 301	S6	U.S. 301 at inter- section of S.R. 470
Bushnell City Hall 504 Market Street Bushnell	S7	U.S. 301, Market Street, Bushnell
Center Hill City Hall Virginia Avenue	S10	I-75, S.R. 476, S.R. 48, Virginia Avenue
Webster City Hall S.E. 1st Street	S10	U.S. 301, S.R. 478, S.R. 471
Wildwood City Hall 100 N. Main St.	S3	U.S. 301, Main St.
Oxford Post Office Hwy. 301	S2	U.S. 301

TABLE 3-4

MARION COUNTY RECEPTION CENTERS

<u>Location</u>	<u>Evacuation Zone</u>	<u>Access From Major Evacuation Routes</u>
Lake Weir High School SR 464 (Maricamp Road) Candler	M8	U.S. 301, CR 25A to S.R. 464
Dunnellon High School Chestnut Street Dunnellon	M5	U.S. 41, Chestnut Street
East Marion Elementary School SR 40 Lynne	M10	U.S. 301, S.R. 40
North Marion High School CR 329 East Sparr	M3	U.S. 301, CR 329
Vanguard High School 7 N.W. 28th St. Ocala	M14	U.S. 301, CR 200A, 28th St.
North Marion Middle School CR 329 West Sparr	M12	U.S. 301, CR 329
College Park Elementary School 3155 S.W. 26th St. Ocala	M14	I-75, SR 200

TABLE 3-5

CLEARANCE TIMES (in hours)

Transportation Analysis
Withlacoochee Regional Hurricane Plan

REGIONAL VULNERABILITY LEVEL

A w/Tampa Bay
Evacuation

B w/Tampa Bay
Evacuation

RESPONSE
CURVE

LEVY COUNTY

A-Quick Response	4 1/4	4 3/4	4 1/4	4 3/4
B-Medium Response	7 1/4	7 1/4	7 1/4	7 1/4
C-Slow Response	10 1/4	10 1/4	10 1/4	10 1/4

CITRUS COUNTY

A-Quick Response	7 3/4	9 1/4	7 3/4	9 1/4
B-Medium Response	9 1/2	11	9 1/2	11
C-Slow Response	11 1/2	13	11 1/2	13

HERNANDO
COUNTY

A-Quick Response	4 1/4	7 1/4	26	26
B-Medium Response	7 1/2	8 1/4	25 1/2	25 1/2
C-Slow Response	10 1/2	10 1/2	26 1/4	26 1/4

MARION COUNTY

A-Quick Response	5	5	18	18 1/4
B-Medium Response	8	8	19 1/2	19 3/4
C-Slow Response	11	11	21	21 1/4

SUMTER COUNTY

A-Quick Response	4 1/2	4 1/2	18	18
B-Medium Response	7 1/4	7 1/4	19 1/2	19 1/2
C-Slow Response	10 1/4	10 1/4	21	21

Source: Post, Buckley, Schuh & Jernigan, Inc., 1983

TABLE 3-6

EVACUATION TIMES (in hours)

VULNERABILITY LEVEL 'A'

	Response Curve	REGIONAL VULNERABILITY LEVEL	
		A	A w/Tampa Bay Evacuation
Levy County	A-Quick Response	8 1/4 - 9 3/4	8 1/4 - 9 3/4
	B-Medium Response	11 1/4 - 12 3/4	11 1/4 - 12 3/4
	C-Slow Response	14 1/4 - 15 3/4	14 1/4 - 15 3/4
Citrus County	A-Quick Response	11 3/4 - 13 1/4	11 3/4 - 13 1/4
	B-Medium Response	13 1/2 - 16	13 1/2 - 16
	C-Slow Response	15 1/2 - 17	15 1/2 - 17
Hernando County	A-Quick Response	8 1/4 - 9 3/4	30 - 35 1/2
	B-Medium Response	11 1/2 - 13 1/2	29 1/2 - 31
	C-Slow Response	14 1/5 - 16	30 1/4 - 31 3/4
Marion County	A-Quick Response	9 - 10 1/2	22 - 23 1/2
	B-Medium Response	12 - 13 1/2	23 1/2 - 25
	C-Slow Response	15 - 16 1/2	25 - 26 1/2
Sumter County	A-Quick Response	8 1/2 - 9 3/4	22 - 23 1/2
	B-Medium Response	11 1/4 - 12 3/4	23 1/2 - 25
	C-Slow Response	14 1/4 - 15 3/4	25 - 26 1/2

SOURCE: Post, Buckley, Schuh & Jernigan, Inc. and WRPC Staff.

TABLE 3-7

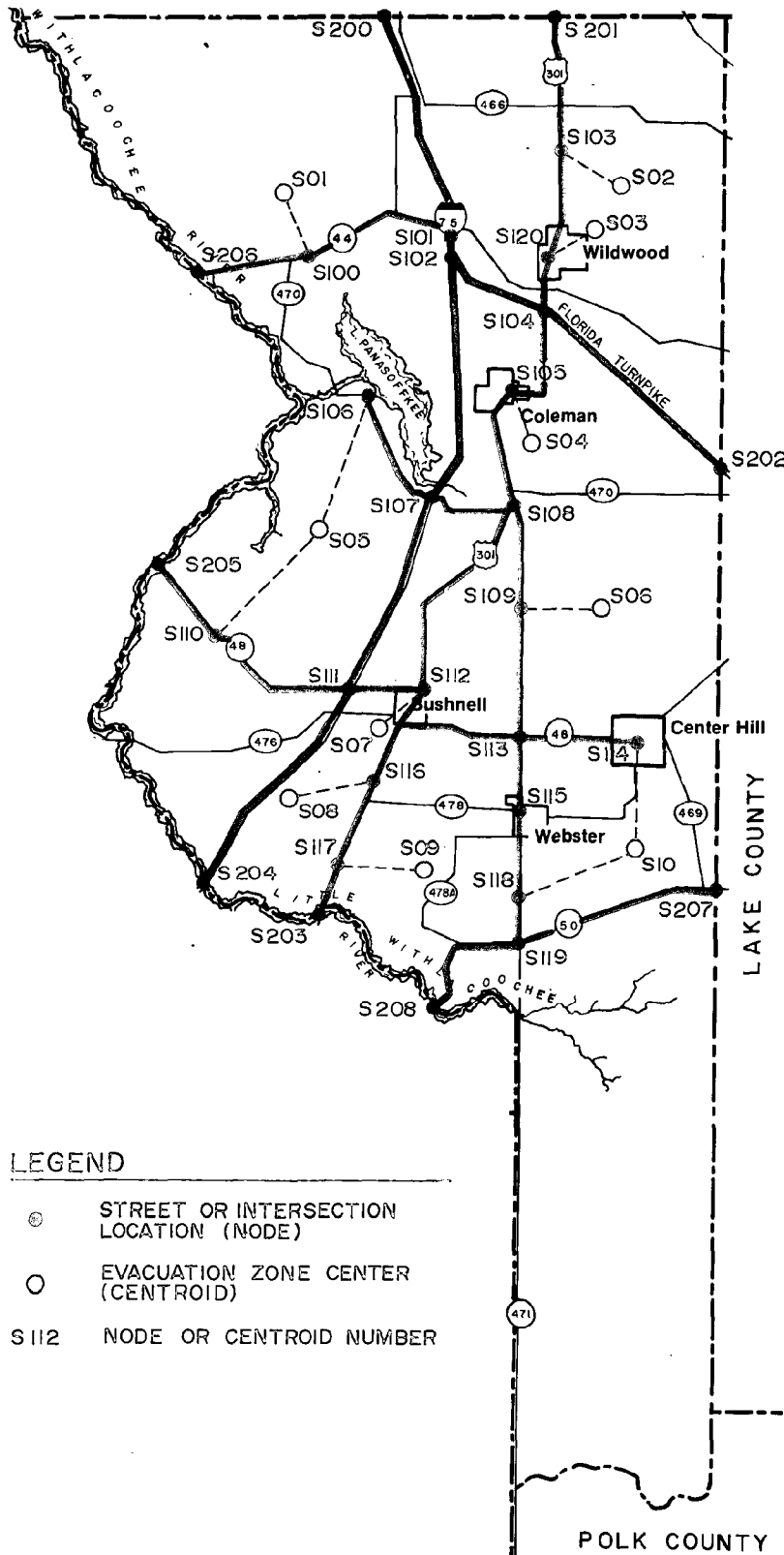
EVACUATION TIMES (in hours)

VULNERABILITY LEVEL 'B'

REGIONAL VULNERABILITY LEVEL			
Response Curve	B		B w/Tampa Bay Evacuation
Levy County	A-Quick Response	10 3/4 - 14 1/4	10 3/4 - 14 1/4
	B-Medium Response	13 1/4 - 16 3/4	13 1/4 - 16 3/4
	C-Slow Response	16 1/4 - 19 3/4	16 1/4 - 19 3/4
Citrus County	A-Quick Response	15 1/4 - 18 3/4	15 1/4 - 18 3/4
	B-Medium Response	17 - 20 1/2	17 - 20 1/2
	C-Slow Response	19 - 22 1/2	19 - 22 1/2
Hernando County	A-Quick Response	16 1/4 - 19 3/4	32 - 35 1/2
	B-Medium Response	14 1/4 - 17 3/4	31 1/2 - 35
	C-Slow Response	16 1/2 - 23 1/4	32 1/4 - 35 3/4
Marion County	A-Quick Response	11 - 14 1/2	24 1/4 - 27 3/4
	B-Medium Response	14 - 17 1/2	25 3/4 - 29 1/4
	C-Slow Response	17 - 18 1/2	27 1/4 - 30 3/4
Sumter County	A-Quick Response	10 1/2 - 14	24 - 27 1/2
	B-Medium Response	13 1/4 - 16 3/4	25 1/2 - 29
	C-Slow Response	16 1/4 - 19 3/4	27 - 30 1/2

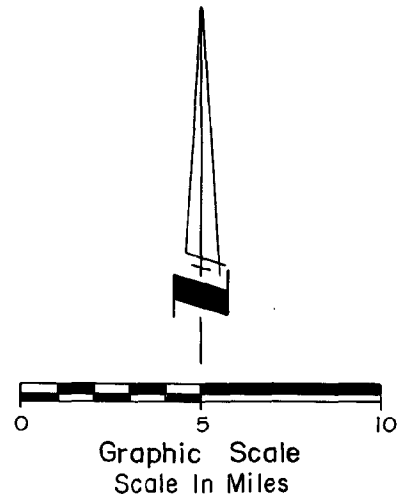
SOURCE: Post, Buckley, Schuh & Jernigan, Inc. and WRPC Staff

MAP 3-1
EVACUATION NETWORK -
SUMTER COUNTY



LEGEND

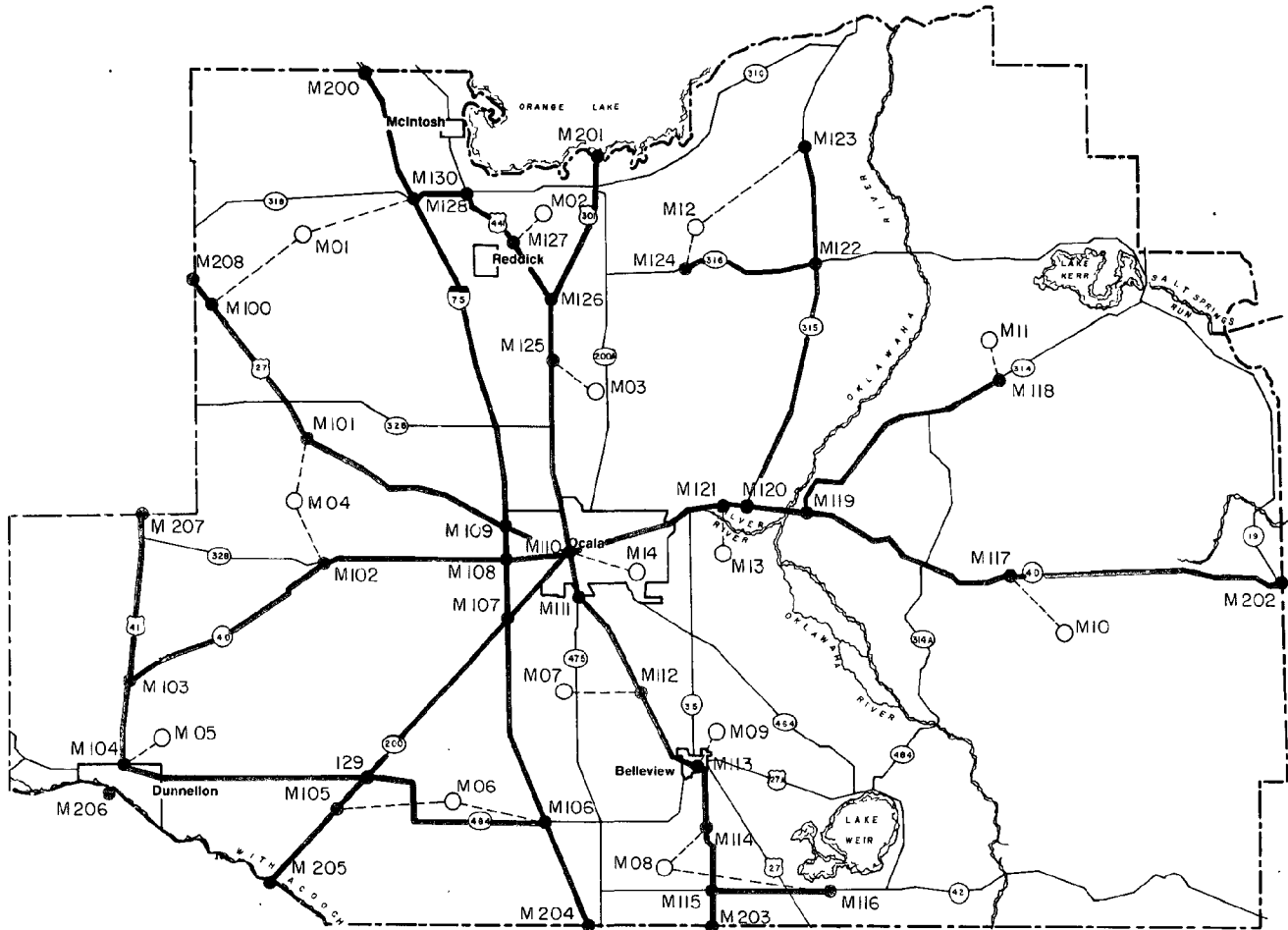
- STREET OR INTERSECTION
LOCATION (NODE)
- EVACUATION ZONE CENTER
(CENTROID)
- S112 NODE OR CENTROID NUMBER



Source: Post, Buckley, Schuh & Jernigan, Inc.

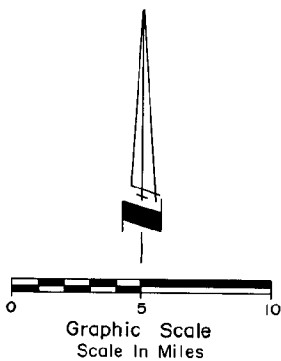
MAP 3-2

EVACUATION NETWORK - MARION COUNTY



LEGEND

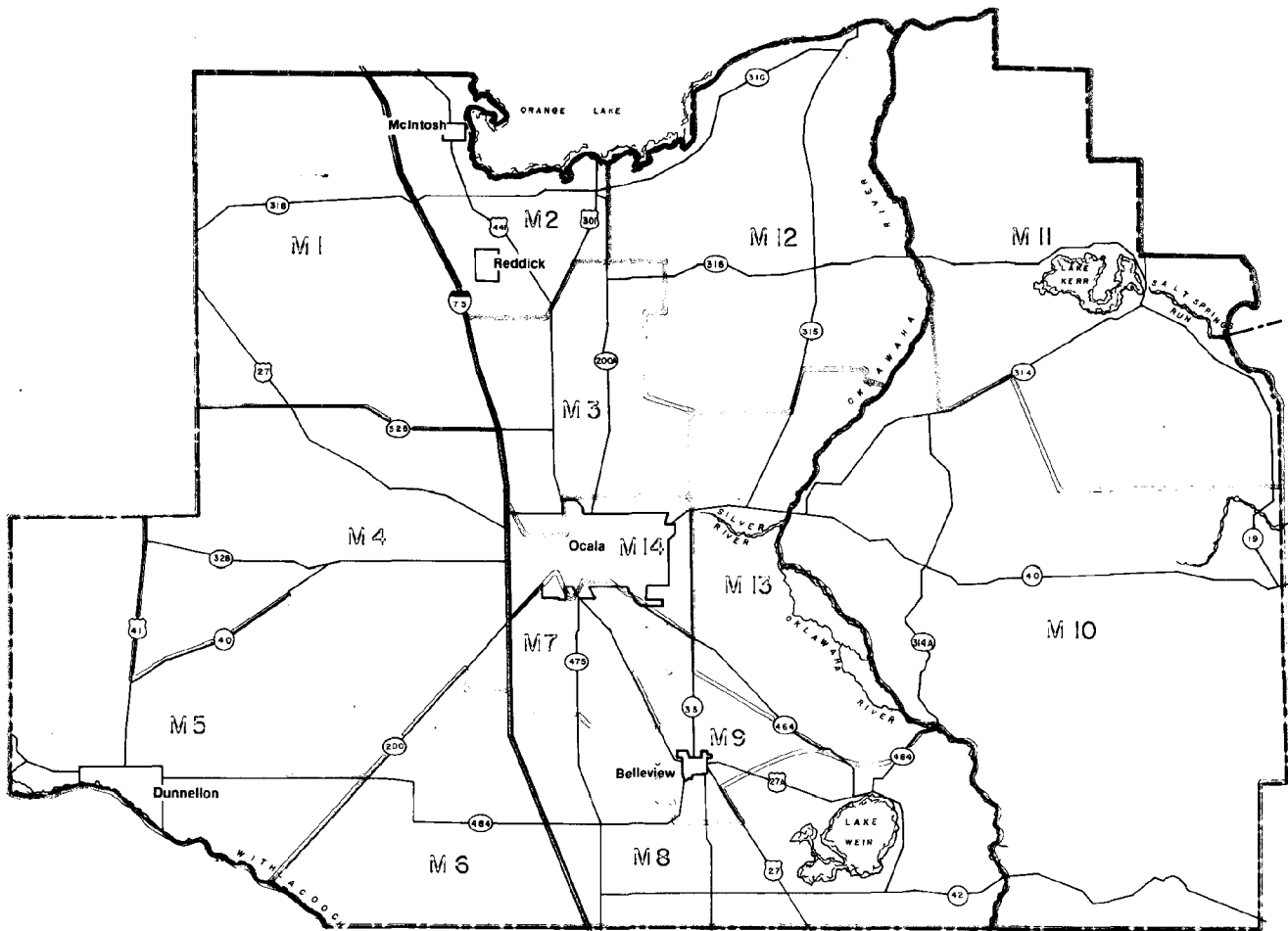
- STREET OR INTERSECTION LOCATION (NODE)
- EVACUATION ZONE CENTER (CENTROID)
- M113 NODE OR CENTROID NUMBER



Source: Post, Buckley, Schuh & Jernigan, Inc.

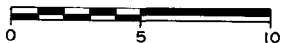
MAP 3-3

EVACUATION ZONES - MARION COUNTY



LEGEND

M 10 EVACUATION ZONE NUMBER

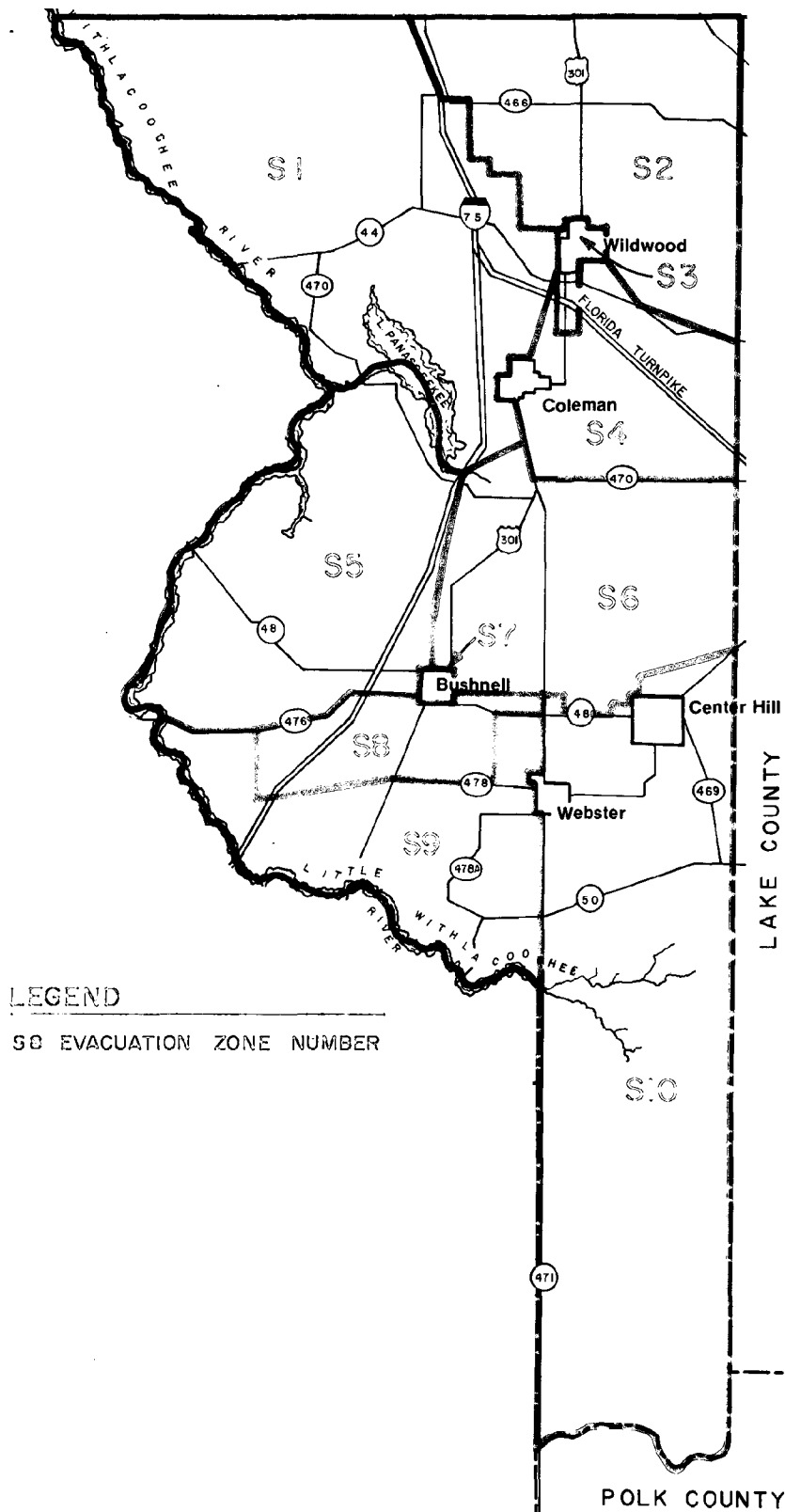


Graphic Scale
Scale In Miles

Source: Post, Buckley, Schuh & Jernigan, Inc.

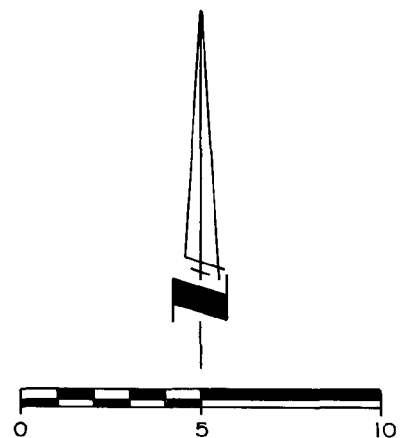
MAP 3-4

EVACUATION ZONES -
SUMTER COUNTY



LEGEND

SC EVACUATION ZONE NUMBER



Source: Post, Buckley, Schuh & Jernigan, Inc.

CHAPTER IV

COORDINATION

Introduction

This chapter will describe a proposed institutional framework for an effective, coordinated response to hurricane emergencies affecting the Withlacoochee Region. The purpose of this framework is to improve communications between counties involved in the evacuation, and to provide written guidelines that define the roles and responsibilities of each agency prior to the onset of the emergency. As part of this framework, coordinative procedures are established to ensure that the opening of reception sites and inland sheltering facilities are coordinated with evacuation movements from counties along the east and west coasts of Florida.

The first section of this chapter will discuss the governmental entities involved in an evacuation. The next section will describe the proposed framework for coordination and define the roles and responsibility of the participants at the State, regional and local levels. Finally, procedures for implementation of the institution framework will be discussed.

Proposed Framework for Emergency Evacuation Management

Lead Agency

To effectively coordinate a regional response to a hurricane emergency, a lead agency must be designated to provide a linkage among the organizational participants. The lead agency must have jurisdiction over a multi-county area, and possess sufficient expertise, staff and funding to effectively manage the evacuation. A reliable communication system is also crucial for the overall coordination of the evacuation.

It is proposed that the Central Florida Area Office for the Bureau of Emergency Management (CEFA), located in Wildwood, be designated as the lead agency for interregional evacuation management. While other entities were considered for designation as lead agency, CEFA appears to be best qualified for terms of the criteria mentioned above. (See Figure 1.)

As the lead agency with overall responsibilities for coordination in the Withlacoochee Region, CEFA will serve as the focal point for the flow of information on hurricane warnings, evacuations and shelter openings.

Regional Entities

Organizations that will be involved at the regional level include the Florida Highway Patrol, the Red Cross and the Health and Rehabilitative Services Department. The FHP maintains traffic control and maintains the progress of the evacuation. Continuous communication with the regional EOC will provide up-to-the-minute information on the evacuation and thereby improved decision-making during the emergency. The Red Cross will be involved at the regional level in the opening and staffing of shelters. The regional office of the Red Cross would assist in areas without a local Red Cross Chapter. The State Department of HRS provides manpower assistance to the Red Cross should insufficient personnel be available for staffing of hurricane shelters.

County Entities

The County offices of civil defense or civil preparedness are responsible for marshaling county resources during and after a national disaster or emergency. The key contact person in each county is the civil defense director who is kept informed of conditions in the county and incorporated areas. The civil defense director reports to the county commission who are empowered to issue the evacuation order.

Other entities at the county level include the Red Cross, law enforcement, school boards, fire departments and so forth. The responsibilities of county agencies are specific to each county and are described in the respective peacetime emergency plans.

Assignment of Coastal Evacuees

The assignment of evacuees from the at-risk coastal areas of Levy, Citrus and Hernando Counties will be based on the criteria of the fastest and most efficient movement from the evacuation zones to shelter facilities. This assignment is accomplished using a computerized model of the transportation network.

The assignment of coastal evacuees from outside the region (e.g. Tampa Bay) will be accomplished by directing evacuees to a division headquarters or reception sites within the host county. At these sites evacuees will be assigned to a shelter facility and given directions to that facility. This will enable the county to open shelters on an "as needed" basis and take best advantage of scarce manpower. It is assumed that dependable communications between the county EOC and the division headquarters (or reception sites) be maintained.

Figure 4-1

Emergency Facility Profile

Name

Central Florida Area Office (CEFA),
Bureau of Emergency Management

Location

E. C. Rowell Building
S.R. 301 & 44A
Wildwood, Sumter County

Communication Systems:

- Standard Phone line
- Local Government Radio (18 counties, daily roll call)
- National Warning System (NAWAS - dedicated telephone line, some counties only)
- State Warning System (telephone line)
- "Hot ring" to nuclear plant and Levy and Citrus Counties
- Emergency Telephones - 16 telephones

Staffing

Normal Conditions - Hours 8 a.m. - 5 p.m., M-F
Secretary
Communicator
Local Government Assistance Representative

Emergency Conditions - 24 hours until emergency is over.
In addition to normal staff, representatives from
State agencies are present at the site (e.g. Florida
Highway Patrol)

Other Facilities

EOC Room, Status Board, area-wide maps

Traffic Control Points

Designation of possible traffic control points for evacuees from the coastal Withlacoochee Region and Tampa Bay Planning Region are presented on Maps 3-1 and 3-2.

Procedures for Implementation of The Interregional Evacuation Plan

To be effective, the plan for interregional evacuation must contain a coordinative mechanism to establish procedures for the opening of shelters and reception sites in coordination with evacuation movements. The coordination between evacuation and sheltering must be present in the event of either a west coast storm or a east coast storm. The proposed procedures for implementation of the interregional plan are described below for each phase of the hurricane emergency.

Normal Conditions

Representatives of the participating agencies involved in the plan will meet on a regular basis to enhance ongoing coordination among the agencies and identify problems with the implementation of the plan.

This group should meet as a permanent committee, and focus on the regional aspects of hurricane planning and operations. Activities of the committee may include:

- testing of the plan
- review of the institutional arrangements for coordination
- improvement of public awareness of hurricane hazards
- exchange information on ways to improve disaster response and recovery

Emergency Conditions

As a hurricane develops and threatens land areas, the National Hurricane Center will issue a hurricane watch twenty four to forty-eight hours before landfall. This alerts threatened areas to potential storm conditions. A hurricane warning is issued twelve to twenty-four hours before landfall and signals that hurricane conditions are imminent. These warnings are issued to the State Bureau of Emergency Management as well as county civil defense offices.

The Civil Defense offices of the threatened coastal counties advise their respective county commissions and provide recommendations as to the evacuation order and the activation of emergency plans. This issuance of the evacuation order is the trigger mechanism that initiates the implementation of the inter-regional evacuation process. The office issuing the evacuation order must notify the Area Office Bureau of Emergency Management (CEFA) so that coordination may move forward. The CEFA office will then notify inland county civil defense directors as well as appropriate State agencies of the influx of evacuees. The Area Office should be given as much information as possible concerning the evacuation so that inland civil defense directors can open the appropriate number of shelters and mobilize county resources to handle the emergency. Throughout the evacuation CEFA should monitor the reception centers and checkpoint sites and feed this information to inland civil defense directors and the Red Cross. With a constant flow of information coming into the Area Office, problem areas can be quickly identified and decision-making will be based upon a good knowledge of existing conditions.

The procedures for interregional evacuation described in this section will apply to both landfalling storms and those storms that parallel the coast. A storm track that parallels the east or west coast of Florida will not require the evacuation of inland county residents, but a significant number of evacuees may be expected from highly populated coastal areas outside the region. If an extensive evacuation occurs in the Tampa Bay area, interregional coordination will be needed to notify the inland counties as to the number of evacuees expected and what routes they will take. Coordination will also be necessary to handle traffic that will pass through to other areas.

Landfalling storms will generate evacuees from coastal areas as well as inland counties. The coordinative framework will also be necessary in this case to assure that evacuation movements are coordinated with the opening of shelter facilities.

Post Emergency Conditions

As the hurricane hazard recedes from the region, the Area Coordinator should continue to act as the liaison between coastal and inland counties. Information on when it is safe to return to affected areas can be transmitted to the inland county civil defense offices. The Area Office should also assist where ever possible in an expedient and effective disaster recovery process.

After recovery has been completed, the interregional committee should meet to evaluate the plan as implemented and identify any problems that may have occurred.

Public Notification

During non-emergency periods, public information and education is disseminated by various agencies through news releases, news features, and radio and television programs. Such activity serves to increase awareness of emergency preparedness programs and provides the citizens with a knowledge of the basic precautions necessary during an emergency.

During emergency periods, it is necessary to provide the public with clear, concise, and timely information and instructions. It is important that one single agency in each jurisdiction be designated as the source of public information in an emergency. This will avoid the issuance of conflicting reports and provide a continuous flow of information regarding governmental decisions, recommendations and instructions. Public notification and instructions will be issued by the civil preparedness agency within each respective jurisdiction. This information should be disseminated after consultation and coordination with the Central Florida Area Office, Bureau of Emergency Management.

While primary responsibility for public notification is conferred to the respective civil preparedness agencies, it is suggested that the procedures below be incorporated into the public notification process to improve interregional coordination. These suggestions are divided into three phases: normal, emergency, and post emergency conditions.

Normal

Public information materials developed as part of the Regional Inland Shelter Study (and prepared by the Regional Planning Council) should be disseminated to coastal and inland residents. This material will educate the public on hurricane hazards, and provide instructions based on the findings of the inland shelter study. The material will identify the sources of further information and assistance during the emergency phase.

Emergency

It is suggested that as the emergency approaches, an emergency public information officer be activated to act as the only official source of public information for that jurisdiction. This officer should be pre-designated and in constant communication with the National Hurricane Center, surrounding EOC's and CEFA.

Evacuation and sheltering instructions on cassette tapes or radio scripts which have been prepared beforehand can be disseminated at this time. In the print media, area newspapers could print hurricane supplements which have been prepared in cooperation with the civil preparedness agency.

Post Emergency

In this phase the public information officer should continue to be the official source of public information and should receive information from various service agencies for dissemination to the public. The officer should assist State and Federal officers in local dissemination of information concerning their programs.

Personnel for Reception Centers and Shelters

Assignment and notification of personnel to emergency facilities is the responsibility of the county civil defense director. The mobilization of emergency personnel will follow the issuance of an evacuation order. Through consultation with CEFA, the civil defense director should have a good idea of the timing and scope of the evacuation in coastal areas. He may then mobilize county resources to the required level.

To ensure that shelters and reception centers are properly staffed in an emergency, it is suggested that procedures be established for assignment and notification of personnel. These procedures should be developed as part of a plan of action that is consistent with the regional plan and relevant to the needs and resources of the county.

Suggested Plan of Action

Key members of county government, the Red Cross and other agencies should meet with the civil defense director as a group to establish the roles and responsibilities of the participants. A plan of action can be devised to acquaint each member with the duties that his organization is expected to perform.

The group or committee is put on call with the issuance of the hurricane watch. Key members of the committee (those in charge of a county division for example) would meet with the civil defense officer to review plans, and determine readiness of equipment, supplies and personnel.

Prior to the recommended evacuation order time, the key personnel would activate their departmental or agency emergency plans, and alert and maintain communications with personnel. As evacuations are announced, the committee would monitor the situation and respond to instructions from the civil defense officer.

Within 12 hours of projected hurricane arrival, the EOC should be fully operational with each participant performing assigned duties and tasks. Emergency operations would be in full swing and involve several different areas:

- communication with the Red Cross for shelter openings
- broadcast of hurricane precautions
- communications with public utilities
- law enforcement: patrols, road blocks, rescues
- coordination of emergency services and needs

With the onslaught of the hurricane, activities in the effected areas are halted. The progress of the storm and emergency operations are monitored at the EOC.

After the danger has passed, post disaster operations will be initiated. A written report and evaluation should be provided to the civil defense officer.

CHAPTER V

RECOMMENDATIONS

Shelter Facilities

Upgrade Existing Shelters

Primary shelters should be supplied with emergency generators to keep the shelter in operation and to maintain operation of water supply and wastewater disposal systems.

Alternate Shelter Facilities

To improve the inventory of public sheltering facilities, civil defense officials and the Red Cross should establish agreement with the owners of alternate shelters. Each facility should be approved by the Red Cross for use in a hurricane evacuation. Opportunities for shelter management training should be provided to alternate shelter personnel.

On-Site Shelter Facilities

To reduce the demand for public shelters, it is recommended that on-site recreational centers in mobile home parks be used, where feasible, for sheltering.

Public Information

Public Awareness

Many residents at-risk in the Withlacoochee Region are not aware of the hazards of hurricanes. For example, the behavioral survey revealed that 22% of the respondents think that their mobile home is safe in a hurricane. To educate the public on the destructive potential of hurricanes, a comprehensive public information program is recommended.

Regional Disaster Preparedness Advisory Committee

It is recommended that a permanent disaster preparedness advisory committee be established to enhance the inter-regional coordination necessary for an effective and efficient evacuation process. This committee would serve to clarify the inter-regional evacuation process and the duties and responsibilities of agencies involved in that process. The agencies involved would be more likely to integrate and work cohesively together during an emergency if they have the opportunity to meet informally on a regular basis prior to the event. Procedures for notification of evacuations suggested in this study would be formalized by this committee.

In addition to developing procedures for notification of evacuations, the committee could also undertake other activities including:

- the formulation of written mutual aid agreements;
- the exchange of information and ideas on operational problems and concerns;
- development of a mock regional evacuation event to test the adequacy of local and regional hurricane plans;
- updating of the plans to more accurately reflect population changes, highway and bridge conditions and shelter availability.

By assuring rapid and reliable inter-regional communications, this framework will provide the best possible response to a hurricane emergency.

Plan Updating

To respond to changing conditions it is recommended that the evacuation plan be updated periodically. The WRPC has the capability to modify the transportation model to reflect population changes, highway/bridge changes and so forth. Updates to the plan should occur when deemed appropriate by the Regional Disaster Preparedness Advisory Committee and by the Withlacoochee Regional Planning Council.

APPENDIX

- A. The Saffir/Simpson Hurricane Scale
- B. Tampa Bay Area Residents Requiring Shelter in the
Withlacoochee Region
- C. Inventory Criteria of Current Primary Public Shelter
- D. Behavioral Survey Methodology

APPENDIX A

THE SAFFIR/SIMPSON HURRICANE SCALE

The Saffir/Simpson Hurricane Scale is used by the National Weather Service to give public safety officials a continuing assessment of the potential for wind and storm surge damage from a hurricane in progress. Scale numbers are made available to public safety officials when a hurricane is within 72 hours of landfall. Scale assessments are revised regularly as new observations are made, and public safety organizations are kept informed of new estimates of the hurricane's disaster potential.

Scale numbers range from 1 to 5. Scale No. 1 begins with hurricanes in which the maximum sustained winds are at least 74 mph, or which will produce a storm surge 4 to 5 feet above normal water level, while Scale No. 5 applies to those in which the maximum sustained winds are 155 mph or more, which have the potential of producing a storm surge more than 18 feet above normal.

The scale was developed by Herbert Saffir, Dade County, Florida, consulting engineer, and Dr. Robert H. Simpson, former National Hurricane Center director, and projects scale assessment categories as follows:

Category No. 1 - Winds of 74 to 95 mph. Damage primarily to shubbery, trees, foliage, and unanchored mobile homes. No real damage to other structures. Some damage to poorly constructed signs. Storm surge 4 to 5 feet above normal. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings.

Category No. 2 - Winds of 96 to 110 mph. Considerable damage to shrubbery and tree foliage; some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage to roofing materials of buildings; some window and door damage. Coastal roads and low-lying escape routes inland cut by rising water two to four hours before arrival of hurricane center. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying island areas required.

APPENDIX A

Category No 3 - Winds of 111 to 130 mph. Foliage torn from trees; large trees blown down. Practically all poorly constructed signs blown down. Some damage to roofing materials of buildings; some window and door damage. Some structural damage to small buildings. Mobile homes destroyed. Storm surge 9 to 12 feet above normal. Serious flooding at coast and many smaller structures near coast destroyed; large structures near coast damaged by battering waves and floating debris. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Flat terrain 5 feet or less above sea level flooded inland 8 miles or more. Evacuation of low-lying residences within several blocks of shoreline possibly required.

Category No. 4 - Winds of 131 to 155 mph. Shrubs and trees blown down; all signs down. Extensive damage to roofing materials, windows, and doors. Complete failure of roofs on many small residences. Complete destruction of mobile homes. Storm surge 13 to 18 feet above normal. Flat terrain 10 feet or less above sea level flooded inland as far as six miles. Major damage to lower floors to structures near shore due to flooding and battering by waves and floating debris. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Major erosion of beaches. Massive evacuation of all residences within 500 yards of shore possibly required, and of single-story residences on low ground within two miles of shore.

Category No. 5 - Winds greater than 155 mph. Shrubs and trees blown down; considerable damage to roofs on many residences and industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings over-turned or blown away. Complete destruction of mobile homes. Storm surge greater than 18 feet above normal. Major damage to lower floors of all structures less than 15 feet above sea level within 500 yards of shore. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Massive evacuation of residential areas on low ground within five to ten miles of shore possibly required.

Dr. Neil Frank, present National Hurricane Center director, has adapted atmospheric pressure ranges to the Saffir/Sampson Scale. These pressure ranges, along with a numerical breakdown of wind and storm surge ranges are:

APPENDIX A

<u>SCALE NUMBER</u>	<u>CENTRAL PRESSURES</u>		<u>WINDS</u>	<u>SURGE</u>	<u>DAMAGE</u>
	<u>MILLIBARS</u>	<u>INCHES</u>	<u>(MPH)</u>	<u>(FT.)</u>	
1	980	28.94	74- 95	4- 5	Minimal
2	965-979	28.5 -28.91	96-110	6- 8	Moderate
3	945-964	27.91-28.47	111-130	9-12	Extensive
4	920-944	27.17-27.88	131-155	13-18	Extreme
5	920	27.17	155+	18+	Catastrophic

APPENDIX B

TAMPA BAY AREA RESIDENTS REQUIRING SHELTER IN THE WITHLACOOCHEE REGION

Introduction

The demand for shelter services from coastal evacuees will be a major factor in determining the shelter requirements of the inland counties of the Withlacoochee Region. During a hurricane event, inland areas are expected to receive a substantial number of coastal residents evacuating from the most severe hurricane hazards. Marion and Sumter Counties will probably absorb a considerable number of those shelter-bound coastal evacuees. For planning purposes it is necessary to estimate just how many coastal residents will come to the inland counties seeking public shelters under various hurricane conditions. To develop estimates of inland shelter demand from Tampa Bay area coastal evacuees, information from a variety of sources is used.

The Bureau of Emergency Management, Department of Community Affairs has done research in this area relating to coastal demand for shelter facilities, identification of evacuation routes and expected numbers of evacuees by evacuation route. The Bureau's research relevant to the Withlacoochee Region is included in this appendix.

Another useful source of estimates of coastal evacuees is found in the Tampa Bay Region Hurricane Evacuation Study. This study contains projections of the evacuation population as well as the destinations for each of several hurricane scenarios. The highly populated Tampa-St. Petersburg area has a significant impact on shelter requirements of inland areas.

This appendix will describe several regional hurricane scenarios used to quantify evacuation movement in the Tampa Bay Area. In addition, this section will describe the anticipated impacts of this influx on the inland counties.

Regional Hurricane Scenarios

Regional hurricane scenarios can be defined as hypothetical hurricane tracks with various intensities. Twelve regional hurricane scenarios have been identified by the Bureau of Emergency Management.

Each of these scenarios simulates the three major tracks which a west coast hurricane would be most likely to take: striking the southwest coast, striking the Tampa Bay area, or paralleling the coast. Each of these major tracks is further broken down by assuming worst case conditions for one of the counties. This produces the twelve regional hurricane scenarios.

For purposes of evacuation planning in this region, storm tracks striking the Tampa Bay area, and parallel tracks are most important. It is assumed that a hurricane striking the southwest coast of Florida will generate evacuees bound for shelters in the inland counties of the Southwest, Central Florida, and East Central Florida Planning Region. Therefore, only five of the 12 regional hurricane scenarios identified by the Bureau are important to the Withlacoochee Region. These are the scenarios for the four counties of the Tampa Bay region, and the scenarios for the parallel track storm. Table B-1 presents these scenarios and table B-2 defines the letter designated for each scenario as it relates to storm intensity.

Through this network of county scenarios, regional scenarios, as they relate to potential generated evacuees, can be identified. This matrix serves to provide decision-makers with a mechanism for assessing the impacts of hurricane tidal flooding and winds not only from a direct strike, but the effects of a storm that passes close by. This matrix however, is contingent upon a hurricane following a "typical" storm track as defined by the National Hurricane Center. Hurricanes usually are subject to erratic behavior, so any decision-making procedure must be flexible enough to account for storms not following a predictable path.

TABLE B-1
COUNTY HURRICANE SCENARIOS

<u>Scenario</u>	<u>Saffir/Simpson Category*</u>				
A	Category 1 or 2 storm				
B	Category 2 or 3 storm				
C	Category 3 of 4 storm				
D	Category 4 storm				
E	Category 5 storm				
*Saffir/Simpson Hurricane Scale					
<u>Scale Number</u>	<u>Central Pressures Millibars</u>	<u>Pressures Inches</u>	<u>Winds (MPH)</u>	<u>Surge (FT.)</u>	<u>Damage</u>
1	980	28.94	74- 95	4- 5	Minimal
2	965-979	28.5-28.91	96-110	6- 8	Moderate
3	945-964	27.91-28.47	111-130	9-12	Extensive
4	920-944	27.17-27.88	131-155	13-18	Extreme
5	920	27.17	155+	18+	Catastrophic

TABLE B-2
COMBINATION OF COUNTY SCENARIOS FORMING
REGIONAL SCENARIOS

<u>REGIONAL SCENARIO</u>	<u>COUNTY SCENARIO</u>			
	<u>Pinellas</u>	<u>Hillsborough</u>	<u>Pasco</u>	<u>Manatee</u>
1 (Pasco Worst Case)	C	B	E	B
2 (Pinellas Worst Case)	E	D	D	C
3 (Hillsborough Worst Case)	D	E	C	D
4 (Manatee Worst Case)	A	C	A	E
5 (Parallel Track)	B	A	B	A

Source: Tampa Bay Regional Planning Council.
Hurricane Evacuation Plan Technical Report, Table G-2,
Appendix G. 1981.

The formulation of regional evacuation scenarios is useful in evacuation planning because it permits analysis of the evacuation activity in counties adjacent to the hardest hit county. Thus each county can be assigned a storm scenario indicating various degrees of severity all of which are less than or equal to the worst case.

The five regional evacuation scenarios in the table below were formulated to represent a worst probable scenario for each county in the Tampa Bay Region (Regional Scenarios 1 through 4) and also a regional scenario representing the trend of county scenarios predicted from a paralleling hurricane (Regional Scenario 5). These five combinations of county scenarios also generally reflect the trends identified from all county scenarios created by the simulation of the reference hypothetical hurricanes through the SLOSH model. This information was used to predict intercounty impacts on clearance time in the evacuation portion of the Tampa Bay study.

REGIONAL SCENARIOS

<u>COUNTY</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Pasco Scenario	E	D	C	A	B
Pinellas Scenario	C	E	D	A	B
Hillsborough Scenario	B	D	E	C	A
Manatee Scenario	B	C	D	E	A

Regional Scenario 1: Worst probable scenario from Pasco County (E=18' + of shoreline surge); Pinellas County Scenario C (9'-12' shoreline surge); Hillsborough County Scenario B (6'-8' shoreline surge); and Manatee County Scenario B (6'-8' shoreline surge). This general combination of vulnerable levels is predicted to be created by landfalling hurricane moving on the "NN" track (see Figure 2 and Table B-3).

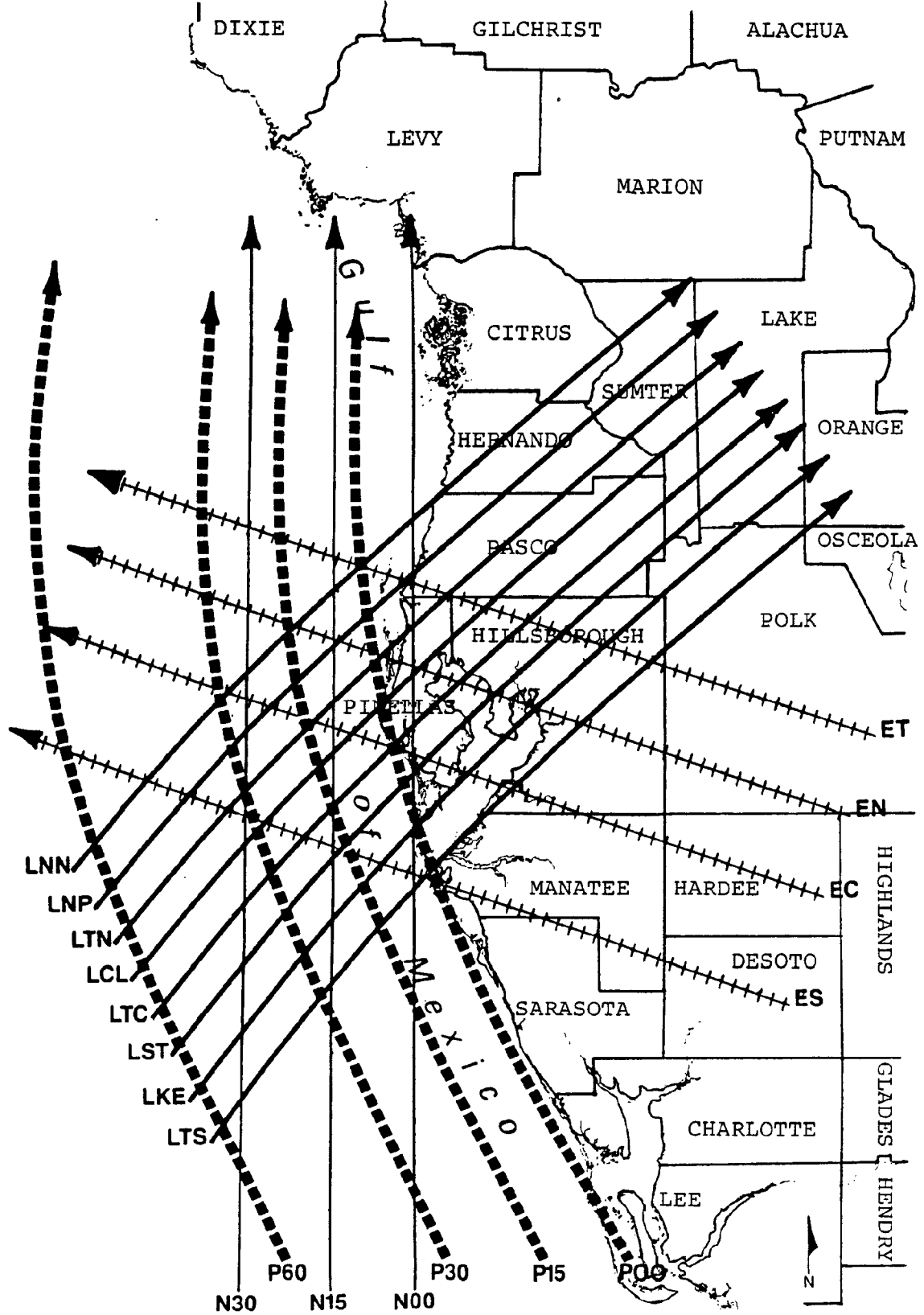
Regional Scenario 2: Worst probable scenario for Pinellas County (E=18' + of shoreline surge); Pasco County Scenario D (13'-18' shoreline surge); Hillsborough County Scenario D (13'-18' shoreline surge); and Manatee County Scenario C (9'-12' shoreline surge). This general combination of vulnerability levels is predicted to be created by landfalling hurricanes moving on the "TN" track (see Figure 2 and Table B-3).

Regional Scenario 3: Worst probable scenario for Hillsborough County (E=18' of shoreline surge); Pasco County Scenario C (9'-12' shoreline surge); Pinellas County Scenario D (13'-18' shoreline surge); Manatee County Scenario D (13'-18' shoreline surge). This general combination of vulnerability levels is predicted to be created by landfalling hurricanes moving on the "TC" track (see Figure 2 and Table B-3).

Regional Scenario 4: Worst probable scenario for Manatee County (E=18'+ of shoreline surge); Pasco County Scenario A (4'-5' shoreline surge); Pinellas County Scenario A (4'-5' shoreline surge); and Hillsborough County Scenario C (9'-12' shoreline surge). This general combination of vulnerability levels is predicted to be created by landfalling hurricanes moving on the "KE" track (see Figure 2 and Table B-3).

Regional Scenario 5: This regional scenario represents the combination of county vulnerability levels predicted to be created by paralleling hurricanes moving on the tracks depicted on Figure 2 and described on Table B-3. Pasco County Scenario B (6'-8' shoreline surge); Pinellas County Scenario B (6'-8' shoreline surge); Hillsborough County Scenario A (4'-5' shoreline surge); and Manatee County Scenario A (4'-5' shoreline surge).

FIGURE B-1
TRACKS OF HURRICANES (Simulated by SLOSH Numerical Storm Surge Model)



Source: Tampa Bay Regional Planning Council,
Regional Hurricane Evacuation Plan
November, 1981. B-6

TABLE B-3

REFERENCE HURRICANES
FOR THE
TAMPA BAY REGION HURRICANE EVACUATION PLAN

MODEL TYPE LOCATION CATEGORY	Landfall/Exiting Point or Closest Approach	Area Receiving Maximum Surge/Winds	Pressure Drop (Milli- bars)	Radius of Maximum Winds (Status Miles)	Forward Speed (Miles per hour)	Direction Storm Moving Toward (Degree Clockwise from North)
SL-L-NN-1	Aripeka	New Port Richey	30	15	15	40°
SL-L-NN-2	Aripeka	New Port Richey	40	15	15	40°
SL-L-NN-3	Aripeka	New Port Richey	60	15	15	40°
SL-L-NN-4	Aripeka	New Port Richey	80	15	15	40°
SL-L-NN-5	Aripeka	New Port Richey	100	10	15	40°
SL-L-TN-1	Tarpon Springs	Belleair Beach	30	15	15	40°
SL-L-TN-2	Tarpon Springs	Belleair Beach	40	15	15	40°
SL-L-TN-3	Tarpon Springs	Belleair Beach	60	15	15	40°
SL-L-TN-4	Tarpon Springs	Belleair Beach	80	15	15	40°
SL-L-TN-5	Tarpon Springs	Belleair Beach	100	10	15	40°
SL-L-TC-1	Madeira Beach	Mouth of Tampa Bay	30	15	15	40°
SL-L-TC-2	Madeira Beach	Mouth of Tampa Bay	40	15	15	40°
SL-L-TC-3	Madeira Beach	Mouth of Tampa Bay	60	15	15	40°
SL-L-TC-4	Madeira Beach	Mouth of Tampa Bay	80	15	15	40°
SL-L-TC-5	Madeira Beach	Mouth of Tampa Bay	100	10	15	40°
SL-L-KE-1	Egmont Key	Longboat Key	30	15	15	40°
SL-L-KE-2	Egmont Key	Longboat Key	40	15	15	40°
SL-L-KE-3	Egmont Key	Longboat Key	60	15	15	40°
SL-L-KE-4	Egmont Key	Longboat Key	80	15	15	40°
SL-L-KE-5	Egmont Key	Longboat Key	100	10	15	40°
SL-E-T-3	Anclote Keys	McKay Bay	60	15	15	288°
SL-E-N-3	Dunedin	McKay Bay	60	15	15	288°
SL-E-C-3	St. Petersburg Beach	Terra Ceia Bay	60	15	15	288°
SL-E-S-3	Whitney Beach	Sarasota Bay	60	15	15	288°
SL-P-POO-1	Egmont Key	Boca Ciega Bay/ St. Joseph Sound	30	15	15	335°
SL-P-POO-2	Egmont Key	Boca Ciega Bay/ St. Joseph Sound	40	15	15	335°
SL-P-POO-3	Egmont Key	Boca Ciega Bay/ St. Joseph Sound	60	15	15	335°
SL-P-P15-1	15 mi. West of Egmont Key	Boca Ciega Bay	30	15	15	335°
SL-P-P15-2	15 mi. West of Egmont Key	Boca Ciega Bay	40	15	15	335°
SL-P-P15-3	15 mi. West of Egmont Key	Boca Ciega Bay	60	15	15	335°
SL-P-P30-1	30 mi. West of Egmont Key	Boca Ciega Bay	30	15	15	335°
SL-P-P30-2	30 mi. West of Egmont Key	Boca Ciega Bay	40	15	15	335°
SL-P-P30-3	30 mi. West of Egmont Key	Boca Ciega Bay	60	15	15	335°
SL-P-P60-4	60 mi. West of Egmont Key	Boca Ciega Bay	80	20	15	335°
SL-P-P60-5	60 mi. West of Egmont Key	Pinellas/Pasco Gulf Beaches	100	10	15	335°

SL - SLOSH (Sea, Lake, and Overland Surges from Hurricanes) Model
 L - Landfalling Hurricane
 E - Exiting Hurricane
 P - Paralleling Hurricane

Source: Tampa Bay Regional Planning Council, Regional Hurricane Evacuation Plan. November, 1981.

Tampa Bay Area Evacuation - Impacts on
Withlacoochee Region

The three main corridors out of the Tampa Bay region into the Withlacoochee Region are shown in the table below. The Withlacoochee region can expect an influx of evacuees to enter Hernando County via Pasco County utilizing U.S. 41, U.S. 301, and I-75. This information was prepared by the Bureau of Emergency Management based upon conversations with coastal county civil defense directors.

TABLE B-4

SUMMARY OF HIGHWAYS
TO BE USED IN INTERREGIONAL EVACUATION

<u>Withlacoochee Planning Region</u>		
<u>Highway Number/Name</u>	<u>From</u>	<u>To</u>
U.S. 41	Pasco County	Hernando County
U.S. 301	Pasco County	Hernando County
I-75	Pasco County	Hernando County

Regional traffic assignments were made by the Bureau based on the following assumptions:

1. That portions of a county's population evacuation on I-75 would remain on that route until they leave the region.
2. That evacuees using U.S. 41 would gravitate toward I-75 as they leave their respective counties.

The Bureau then estimated the number of coastal evacuees entering inland counties by evacuation scenario. This was accomplished in three steps:

1. Applying knowledge derived from the behavioral studies conducted for each hurricane evacuation study to estimate the percentage of coastal evacuees, who would leave the county or region.

2. Converting evacuation population into vehicle counts using regional specific vehicle occupancy rates.
3. Calculating traffic/population route assignments.

Each of these steps required a number of assumptions before calculations could be undertaken. These concern behavioral assumptions, vehicle occupancy rates, and traffic assignments.

Behavioral Assumptions

Of the population evacuating out of the Tampa Bay Region, the following may be seeking shelter in interior counties: Pasco County, 49.5%; Pinellas County, 33.8%; Hillsborough County, 38.6%; Manatee County, 34.0% (Source: Tampa Bay Hurricane Evacuation Plan Technical Data Report).

That portion of the population seeking shelter who cannot find it due to an inadequate supply within their county will evacuate out of both Tampa Bay and Southwest Florida Planning Regions.

Conversion of Population to Number of Vehicles

Vehicle occupancy rates for the Tampa Bay Region were derived from 1970 Census Data updated to 1979 data (Source: Tables G-11 through G-15, Tampa Bay Regional Hurricane Evacuation Plan Technical Data Report).

Regional Traffic/Population Assignments

Traffic assignments on routes out of the Tampa Bay Region were derived from Appendix G, Tampa Bay Regional Hurricane Evacuation Plan Technical Data Report. That portion of a county's population evacuating on I-75 would remain on that route until they leave the region. Evacuees using U.S. 41 would gravitate towards I-75 as they leave their respective counties.

The results of this analysis indicate that a minimum of 90,304 persons can be expected to enter the Withlacoochee Region under the assumption of a scenario 4 hurricane event. The greatest impact to the Region is likely to result from a hurricane striking either Pinellas or Hillsborough County indicated as scenarios 2 and 3. These scenarios generate an evacuation influx of 143,510 persons and 141,304 persons respectively. This information is shown in table B-5 by scenario and by transportation corridor.

TABLE B-5

EVACUATION ROUTES OUT OF TAMPA BAY REGION
Into Withlacoochee Region
Vehicle/Person

Scenario	U.S. 41	U.S. 301	I-75	TOTAL
1	7855/20954	17947/38601	28371/60079	54173/119634
2	10774/29055	22158/47613	35184/66842	68116/143510
3	7820/20977	25789/53455	31247/66872	64856/141304
4	3936/9866	17667/36445	17883/43993	39486/90304
5	-	-	-	-
6	-	-	-	-
7	-	-	-	-
8	-	-	-	-
9	-	-	-	-
10	-	-	-	-
11	-	-	-	-
12	5816/13279	17887/38601	25690/53616	48763/105496

Source: Florida Department of Community Affairs, Bureau of Disaster Preparedness, 1981.

Evacuees Desiring Shelter

Once regional evacuation routes and the resultant traffic impact on receiving regions were established, the Bureau of Emergency Management determined the number of evacuees desiring shelter. The percentage of evacuees who would be shelter-bound was determined by behavioral study results in the Tampa Bay region. Table B-6 through B-16 delineate by regional scenario the evacuation population (by county) entering the Withlacoochee region. In the Tampa Bay study, respondents were asked what their destination would be if asked to evacuate; 37.9% + 1.4% named a Red Cross shelter; 25.8% + 1.3% answered the home of a friend or relative; 18.8% + 1.1% said a hotel or motel; and 17.4% + said they did not know. Of the population evacuating out of the Tampa Bay region, the following will be seeking shelter in interior counties: Pasco County, 49.5% Pinellas County, 33.8%; Hillsborough County, 38.6%; Manatee County, 34%. Thus, in order to determine the number of people desiring shelter in the Tampa Bay Region, the Bureau used the following formula:

Total County Evacuation Population	x	Corresponding County % of Populating Desiring Shelter	=	Number of People Desiring Shelter
--	---	--	---	--------------------------------------

Under a Regional Scenario 1, for instance, 21,706 people in Pasco County would evacuate to the Withlacoochee Region. The number of these evacuees desiring shelter was derived by the following calculation:

$$21,706 \times 49.5\% = 10,744.47$$

Thus, 10,745 evacuees leaving Pasco County would desire shelter in the Withlacoochee planning region. Under that Regional Scenario, a total of 119,634 evacuees from Pasco, Pinellas, and Hillsborough Counties would enter the Withlacoochee region. Of this population, 45,163 would desire shelter.

Table B-17 is a summary of this information as it relates specifically to the Withlacoochee Region. Regional Scenario #2 triggers the greatest number of evacuees entering the Withlacoochee Region via the three major routes (US 41, US 301 and I-75). Approximately 53,593 people desiring shelter are expected to travel these three routes under Regional Scenario 2.

TABLE B-6

REGIONAL SCENARIO 1

	Pasco	Pinellas	Hillsborough	Manatee	Other Counties	Total
Total Evacuation Population	21706	115392	57514	23115	--	217727

Evacuation Pop. Entering Withlacoochee Region	21706	70419	27509	--	--	119634
No. of People Desiring Shelter	10744	23801	10618	--	--	45163

Evacuation Pop. Entering Central Florida Region	--	44973	30005	23115	--	98093
No. of People	--	15201	11582	7859	--	34642

TABLE B- 7

REGIONAL SCENARIO 2

	Pasco	Pinellas	Hillsborough	Manatee	Other Counties	Total
Total Evacuation Population	19790	153166	93784	28470	--	295207
Evacuation Pop. Entering Withlacoochee Region	19790	82476	41244	--	--	143510
No. of People Desiring Shelter	9796	27877	15920	--	--	53593
Evacuation Pop. Entering Central Florida Region	--	70690	52540	28470	--	151697
No. of People Desiring Shelter	--	23893	20280	9680	--	53853

TABLE B-8

REGIONAL SCENARIO 3

	Pasco	Pinellas	Hillsborough	Manatee	Other Counties	Total
Total Evacuation Population	15086	149822	105273	30814	48418	349413

Evacuation Pop. Entering Withlacoochee Region	15086	79132	47086	--	--	141304
No. of People Desiring Shelter	7468	26747	18175	--	--	52390

Evacuation Pop. Entering Central Florida Region	--	70690	58187	30814	See Next Table	208109
No. of People Desiring Shelter	--	23893	22460	10477	See Next Table (4 cnty only)	58830

TABLE B-9

REGIONAL SCENARIO 4

	Pasco	Pinellas	Hillsborough	Manatee	Other Counties	Total
Total Evacuation Population	12646	86100	61101	34256	86278	230381

Evacuation Pop. Entering Withlacoochee Region	12646	49771	28877	--	--	90304

No. of People Desiring Shelter	6260	16823	11147	--	--	34230

Evacuation Pop. Entering Central Florida Region	--	36329	33214	34256	See	190077

No. of People Desiring Shelter	--	12279	12820	11647	See Next Table	36746 (4 cnty only)

TABLE B-10

REGIONAL SCENARIO 12

	Pasco	Pinellas	Hillsborough	Manatee	Other Counties	Total
Total Evacuation Population	15028	100721	55884	20975	See Next Table	460568
Evacuation Pop. Entering Withlacoochee Region	15028	62959	27509	--	--	131186
No. of People Desiring Shelter	7439	21280	10618	--	--	39337
Evacuation Pop. Entering Central Florida Region	--	37762	28375	20975	See Next Table	355112
No. of People Desiring Shelter	--	12673	10953	7132	See Next Table (4 cnty only)	30758

TABLE B-11

Evacuees Desiring Shelter From Tampa Bay Region

Tampa Area Regional Scenario	Total Evacuation Population	Evacuation Population		No. of People Desiring Shelter
		Entering Withlacoochee Region*		
1.	217,727	119,634		45,163
2.	295,207	143,510		53,593
3.	349,413	141,304		52,390
4.	230,381	90,304		34,230
12.	460,468	131,186		39,337

Source: Florida Department of Community Affairs, Bureau of Emergency Management.

*The total number of people evacuating into Withlacoochee Region regardless of destination (e.g. public shelter, hotel-motel, or friend or relative).

APPENDIX C

INVENTORY CRITERIA OF CURRENT PRIMARY PUBLIC SHELTERS

I. GENERAL INFORMATION

A. Name of Structure _____

B. Address _____

C. Telephone Number _____

D. Type of Structure _____
(i.e., school, commercial building)

E. Owner:

_____ County School Board

_____ County

Private _____

F. Contact Person:

Name _____

Address _____

Phone Number _____

II. SITE LOCATION INFORMATION

A. Building Site Elevation (of ground floor in feet
above mean sea level) _____

B. Total Number of Acres _____

C. Number of Parking Spaces _____

D. Number of Acres Conducive for Potential Parking _____

E. Location in Terms of a Flood Hazard Area _____

APPENDIX C (Cont.)

F. Public Safety Jurisdictions:

1. Fire _____
2. Rescue _____
3. Law Enforcement _____

III. BUILDING CONSTRUCTION CHARACTERISTICS

A. Year Constructed _____

B. Building Classification by Construction

- | | |
|----------------|---------------|
| _____ Type I | _____ Type IV |
| _____ Type II | _____ Type V |
| _____ Type III | _____ Type VI |

C. Roof Type:

- _____ Hip _____ Flat _____ Gable _____ Gambrel
_____ Mansard _____ Other

D. Roof Classification

- _____ Type A _____ Type B _____ Type C _____ Other

E. Roof Covering _____

F. Roof Anchorage _____

G. Exterior Walls:

- _____ Stucco Masonry _____ Brick Masonry _____ Masonry
_____ Jumbo Brick _____ Block Masonry _____ Clay Tile Stucco
_____ Other

H. Floor Covering

- _____ Carpeting _____ Wood _____ Tile _____ Cement _____ Other

I. Number of Floors

J. Types of Windows:

- _____ Awning _____ Casement _____ Double Hung _____ Horizontal
_____ Louver _____ Hopper _____ Jalousie _____ Pivoted _____ Other

APPENDIX C (Cont.)

K. Building Type: Single Wing Other

IV. CODE CONFORMANCE

			<u>Date of Last Inspection</u>
Building Code	<u> </u> Yes	<u> </u> No	<u> </u>
Fire Code	<u> </u> Yes	<u> </u> No	<u> </u>
Health Code	<u> </u> Yes	<u> </u> No	<u> </u>

V. SHELTER AMENITIES

A. Source of Power

1. Ongoing

 Electric Gas Other

2. Auxiliary

 Generator Battery Operated Other

B. Sources of Food

1. Number of people who can be served, based on three daily meals

2. For how long can food service be provided?

C. Sanitary Facilities

1. Toilet Facilities:

a) Number of restrooms: Men Women

b) Number of showers: Men Women

2. Type of wastewater treatment facilities:

a) Sewer Septic Package Plant Other

b) Independent system Dependent system

c) Serviced by

APPENDIX C (Cont.)

3. Potable water supply facilities:

- a) Available emergency supply _____
- b) _____ Independent system _____ Dependent system
- c) Serviced by _____

D. Kitchen Facilities

1. Sources of power

- a) Ongoing Power
- _____ Electric _____ Gas _____ Other
- b) Auxiliary Power
- _____ Generator _____ Battery Operated _____ Other

2. Total Number of Square Footage _____

3. Total Number of Sinks _____

E. Communications

1. Does the shelter have a public address system? ___ Yes ___ No

Control location _____

2. Does the shelter have a weather alert radio? ___ Yes ___ No

Designated Location _____

3. Other Communication Devices:

_____ Telephone _____ Citizen Band Radio _____ Ham-operated radio;
_____ Other _____ is so, is antenna and
_____ Yes ___ No
coax installed?

Designated Location _____

F. First Aid Facilities

1. Does the building have an infirmary? ___ Yes ___ No

2. What is the status of the first aid supplies?

_____ Excellent _____ Good _____ Fair _____ Poor

3. Is any special medical equipment or personnel available?

_____ Oxygen _____ Doctor _____
_____ Nurse _____

[illegible]

- _____ Ramps _____ Specially equipped restrooms
_____ Other _____

G. Transportation Facilities

- Yes No

- | Bus | Van | Automobile | Other |
|-----|-----|------------|-------|
|-----|-----|------------|-------|

3. Does vehicle have a two-way radio? Yes No

VI. DESIGNATED AREAS OF SAFETY AND PLANNED CAPACITY

Total:

APPENDIX C (Cont.)

VII. EMERGENCY MANPOWER

A. Designated Emergency Administrator of Shelter

Name _____

Address _____

Phone Number _____

B. Alternate Emergency Administrators of Shelter

Name _____ Name _____

Address _____ Address _____

Phone Number _____ Phone Number _____

SHELTER VICINITY MAP

MAJOR STREET ACCESSIBILITY TO SHELTER

APPENDIX D

BEHAVIORAL SURVEY METHODOLOGY

A behavioral survey was conducted in the inland counties to provide support data for the regional preparedness plan in the event of a hurricane.

In the counties of Marion and Sumter, mobile homes were considered to represent the greatest population-at-risk that could be practically surveyed. More than 500 residents in these counties were telephoned about their responsiveness to an evacuation order, evacuation destinations, need for specialized transportation, familiarity with hurricanes and similar concerns.

The behavioral survey was completed in four steps:

1. Design of the survey questionnaires.
2. Drawing of the samples.
3. Conducting of the surveys.
4. Compilation and analyses.

The methodologies for these four steps are discussed below.

Design of the Survey Questionnaire

H. W. Lochner, Inc. drafted a notification postcard and survey instruments. This draft was reviewed by the staff of the Withlacoochee Regional Planning Council. After incorporating the changes recommended by the Council staff, the survey was tested on 25 households of varying economic and educational backgrounds in varying geographic areas. Minor wording changes were made and the notification postcard and survey instrument were finalized.

The purpose of the postcard was to maximize the cooperation by potential respondents and minimize the refusal rate. The less refusals, the more confidence can be placed in the eventual results. Refusals can represent a source of bias that is virtually impossible to predict. The original mailed postcards had green lettering and seals on cream stock. Special efforts were made for a professional image with the postcard. An example of the notification postcard is shown on page D-4.

The survey questionnaire is shown on page D-5. It was designed to be short and simple for clarity and ease of administration. The format was designed to be similar to other surveys in Florida so that comparisons of results with other regions is possible.

Drawing of the Sample

Initially, the potential interviewees included residents of any registered mobile home in the two inland counties. In drawing the sample, the goal was to assemble enough names, addresses and phone numbers so that a total of 500 completions would be achieved across the two inland counties. Approximately 20 percent extra names were obtained.

In drawing of the sample of the mobile homes, the cooperation of the county tag agencies was excellent. The Lochner staff was allowed complete access to the necessary records. Names and addresses were selected by finding a random starting point and then proceeding along in accordance with a skip interval number that would produce the desired amount of names and addresses. These names and addresses were simultaneously checked for in the phone directory. Only those registered mobile home owners who were also listed in the phone directory were included in the survey.

Conducting the Survey

One to three days before being called, each potential respondent received the notification postcard. The telephone calls were conducted by the professional interviewers of Gulf Coast Research Corporation of St. Petersburg. The calls extended from May 10, 1982 to May 24, 1982. Five hundred surveys were completed. The public was receptive and the refusal rate was minimal.

Up to four call-backs were placed before abandonment of a potential respondent. The call-back procedure minimized bias. For example, large families should be more apt to answer the phone on the first call than would single-person households. Without call-backs, the single-person households would probably have been less represented.

Compilation and Analysis

The data was compiled and a 95 percent confidence interval was calculated. The 95 percent confidence interval means that if the survey project were repeated 20 times, the results would fall within the indicated confidence interval 19 out of 20 times ($19 \div 20 = 95$ percent).

The confidence interval itself is the method of expressing and qualifying a percentage answer. For example, a typical answer would be that $75\% \pm 4\%$ would take a certain action. Five hundred completed surveys allows us to know that the answers will all have confidence intervals of $\pm 5\%$ or better (an even smaller interval such as $\pm 3\%$).

The analysis of the results was then accomplished. This is presented in Chapter II, Behavioral Analysis Element.

APPENDIX D



1241 S.W. 10th Street
Ocala, Florida 32674-2798

DEAR RESIDENT OR VISITOR:

YOU HAVE BEEN SELECTED TO PARTICIPATE IN A HURRICANE EVACUATION SURVEY BY THE WITHLACOOCHEE REGIONAL PLANNING COUNCIL IN CO-OPERATION WITH YOUR COUNTY CIVIL DEFENSE DEPARTMENT. WE ARE INTERESTED IN KNOWING HOW YOU WOULD RESPOND IN THE EVENT OF A HURRICANE STRIKING YOUR AREA: HOW SOON YOU WOULD LEAVE; WHERE YOU WOULD GO; IF YOU WOULD NEED ASSISTANCE IN EVACUATING AND SO FORTH.

A REPRESENTATIVE WILL PHONE YOU SHORTLY. YOUR ANSWERS TO A FEW BRIEF QUESTIONS ARE IMPORTANT IN HELPING TO DEVELOP AN EFFECTIVE PLAN FOR YOUR AREA. YOUR COOPERATION IS APPRECIATED.

VERY TRULY YOURS,

Jackson E. Sullivan Jr.
JACKSON E. SULLIVAN, A.I.C.P.
EXECUTIVE DIRECTOR



APPENDIX D

INLAND SURVEY (Mobile homes only)

(MAILING LABEL)

9999 999-9999 999.99
Respon- Phone Location
dent No. No. No.

Call No Attempt Detail	1	2	3	4	5
Date	/	/	/	/	/
Time	.m.	.m.	.m.	.m.	.m.
Result					
Person, Time & Date for call- back <div style="display: flex; justify-content: space-between; margin-top: 10px;"> (name) (time) </div> <div style="text-align: right; margin-top: 10px;">.m.</div> <div style="text-align: center; margin-top: 10px;">/ /82</div>					

INTERVIEWER: IF INITIAL RESPONDENT IS APPARENTLY AN ADULT AND, THEREFORE, POSSIBLY THE DESIRED RESPONDENT (HEAD OF HOUSEHOLD OR DECISION-MAKER AS TO WHAT TO DO BEFORE A HURRICANE) CONTINUE; OTHERWISE, MAKE AN APPOINTMENT TO CALL BACK AT A TIME THAT THE RESPONDENT CAN BE REACHED.

INTRODUCTION: "Hello, my name is _____ and I am working on the Hurricane Plan being prepared by the Withlacoochee Regional Planning Council. May I speak to someone who would help decide what to do if a hurricane threatened? (INTERVIEWER, IF PERSON WITH WHOM YOU ARE SPEAKING IS A DESIRED RESPONDENT, CONTINUE WITH)" "Your answers to a few brief questions will be greatly appreciated." (IF YOU START TO MAKE SPECIFIC ARRANGEMENTS TO CALL BACK, BE SURE IT IS A MOBILE HOME BY ASKING "Am I correct that you live in a mobile home?"")

1. Do you live in a mobile home? Yes () No ()
(IF "NO", SAY "Excuse me, but my instructions at this time are to interview only mobile home owners. Your cooperation is still appreciated".)
2. If a hurricane threatened, what information source or who would you depend upon most in deciding whether you would evacuate? (PAUSE, IF NO RESPONSE, ASK)
 - a. Television ()
 - b. Radio ()
 - c. Local government or law enforcement officials ()
 - d. Friend or neighbor ()
 - e. Relative ()
3. For this next question, please assume that everyone is home and you were ordered by a governmental authority to evacuate. How soon could you be ready and would you leave? (PAUSE: IF NO RESPONSE, ASK)
 - a. Immediately ()
 - b. Certain number of hours ()
 - c. Never () , number

FIGURE 3

4a. How many vehicles are there at your home?

(IF NONE, SKIP TO Q4f)

(number)

4b. How many of these vehicles are travel trailers, campers or motor homes?

(number)

(IF THE RESPONDENT ASKS, DO NOT INCLUDE VANS AND TRUCKS IN Q4b. VANS AND TRUCKS WOULD BE PART OF THE ANSWER TO Q 4a).

(IF THERE ARE NO TRAVEL TRAILERS, CAMPERS OR MOTOR HOMES, GO TO Q4e)

4c. How many of these travel trailers, campers or motor homes would you use to evacuate?

(number)

4e. How many vehicles total would you use to evacuate? (GO TO Q5)

(number)

4f. (IF "NONE" IN Q 4a) Would you need transportation such as a bus or a taxi?

Yes ()

No ()

5. How many people live in your home including yourself?

number

6. Is there anybody who could not be evacuated without help from outside your home?

Yes ()

No ()

7. After leaving, where would you go? (PAUSE, IF NO RESPONSE, ASK)

a. To a designated Red Cross Shelter ()

b. To a friend or relative ()

(IF "YES", ASK) And in what county would that be please?

(TAKE A CITY NAME, IF NECESSARY)

c. To a hotel or motel () (IF "YES" ASK) And in what county would that be please?

(TAKE A CITY NAME, IF NECESSARY)

d. Don't know (DON'T READ "DON'T KNOW").

8. Have you ever experienced a direct hurricane strike? Yes () No ()
(IF "YES", ASK) When and where was that, please?

(Year)

(City, State)

9. Do you think that your home is strong enough to be safe against hurricane winds?
(DON'T OFFER AN ANSWER) Yes () No () Maybe ()

10. And I understand that your address is(READ FROM LABEL. MAKE NECESSARY CORRECTION.

Thank You For Your Help!

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